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U.S. Information Services Annual Report

1994

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- Software and Services Market Forecasts
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- U.S. Federal Government
 - Procurement Plans (PAR)
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 - Awards (FAIT)
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CUSTOM PROJECTS

For Vendors—analyze:

- Market strategies and tactics
- Product/service opportunities
- Customer satisfaction levels
- Competitive positioning
- Acquisition targets

For Buyers—evaluate:

- Specific vendor capabilities
- Outsourcing options
- Systems plans
- Peer position

OTHER SERVICES

Acquisition/partnership searches

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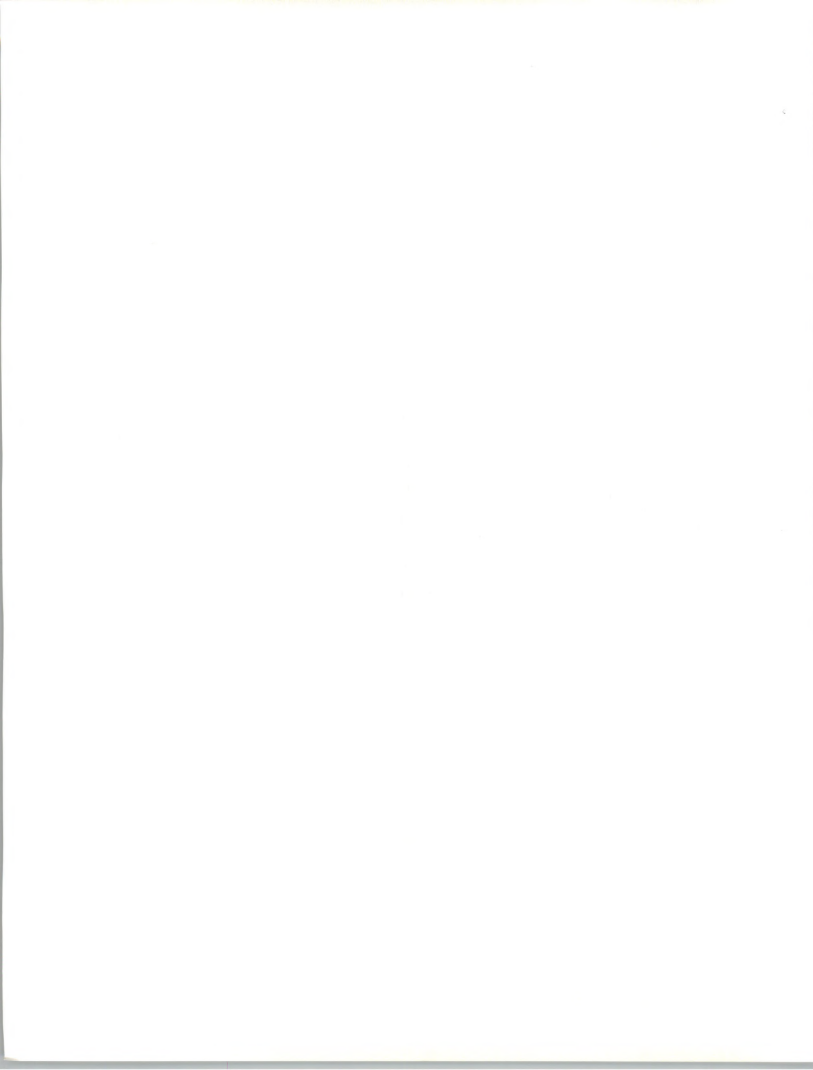
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Abstract

INPUT's 1994 Information Services Annual Report provides a concise look at the \$136 billion dollar U.S. market for information services and products. Designed for the business executive or analyst who needs an understanding of the entire industry, this report identifies major buyer issues, technology and market trends, driving forces, leading vendors and their market shares and offers recommendations and conclusions for each of the major product/service markets tracked by INPUT:

- Professional services (Information technology-related)
- Systems integration
- Outsourcing
- Processing services
- Network services
- Applications software/turnkey systems products
- Systems software products

This report contains 148 pages and 70 exhibits.

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**U.S. Information Services
Market Analysis Program**

U.S. Information Services Annual Report, 1994

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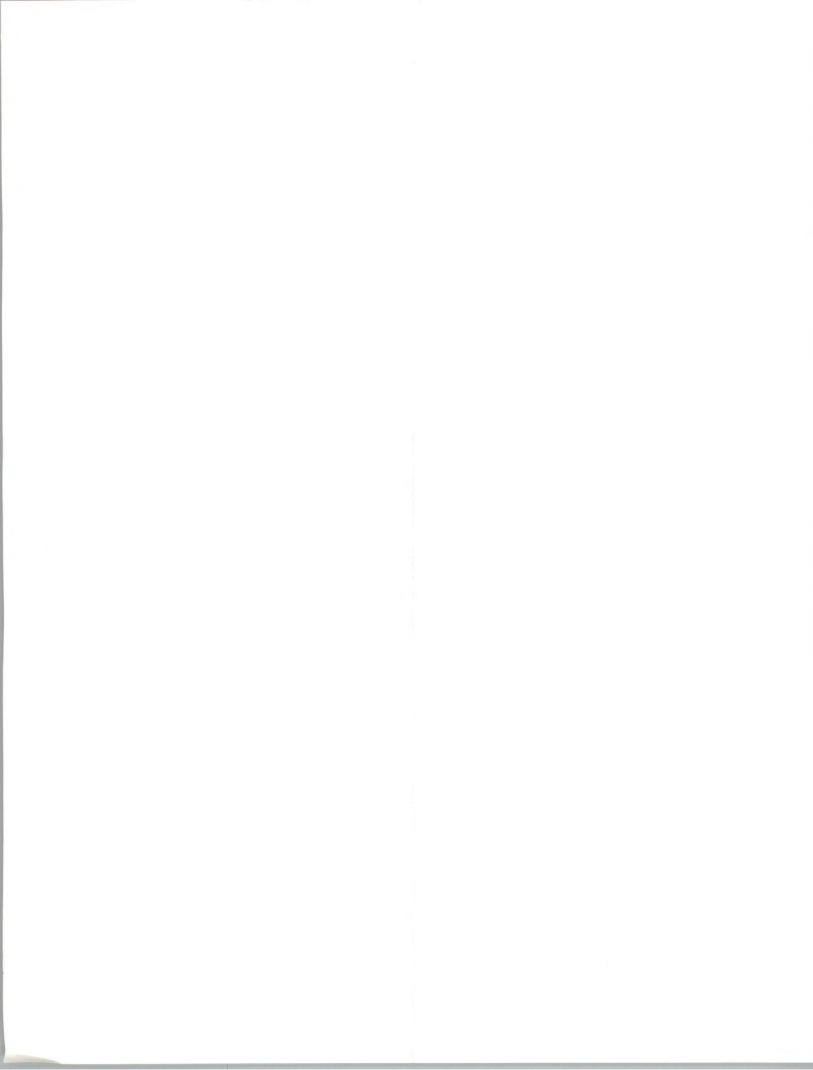
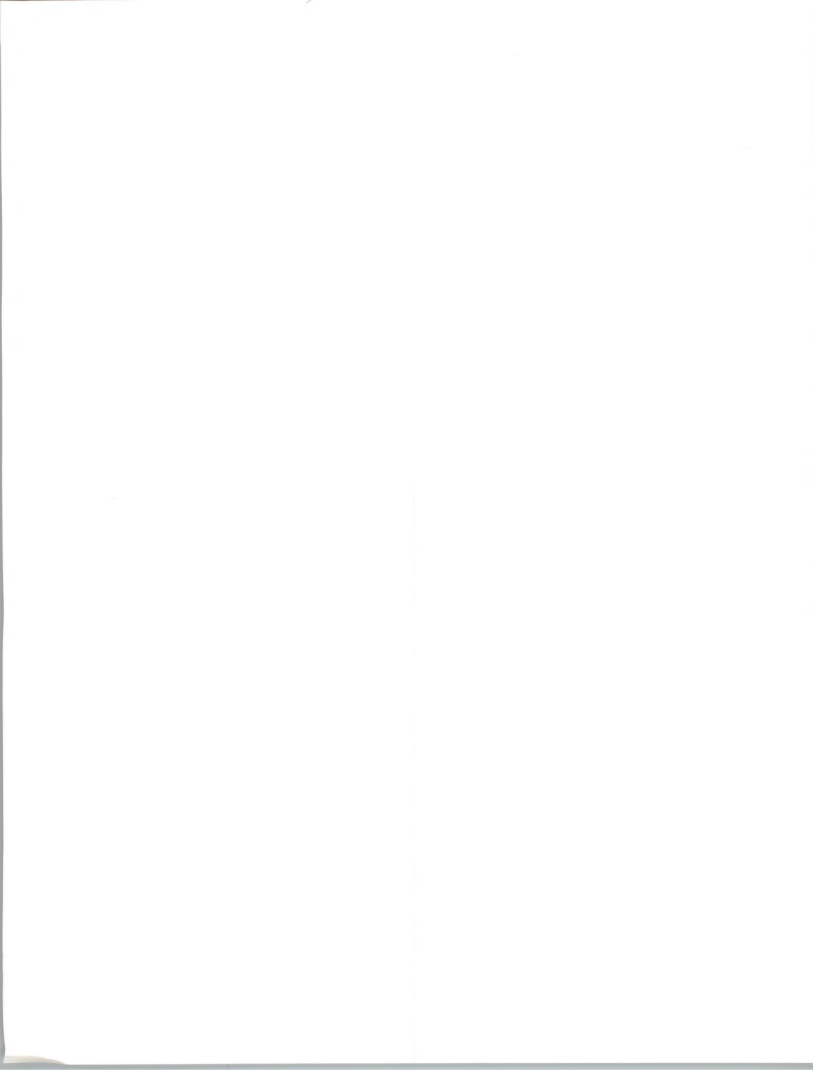


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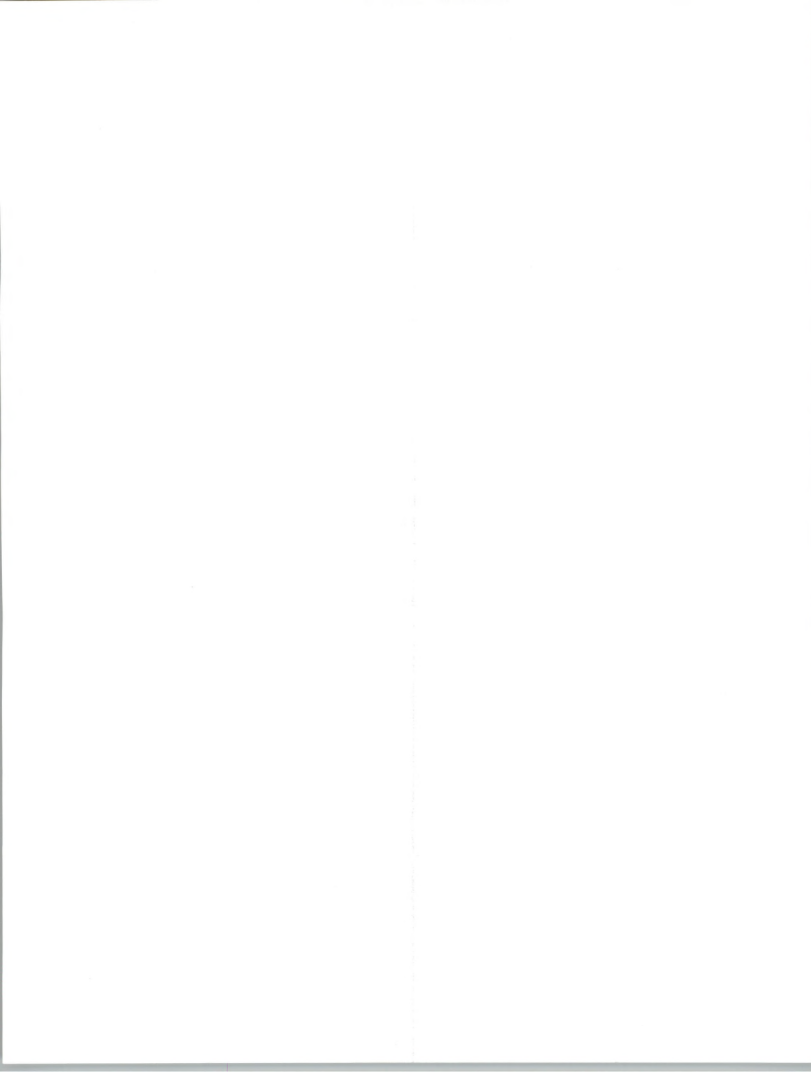
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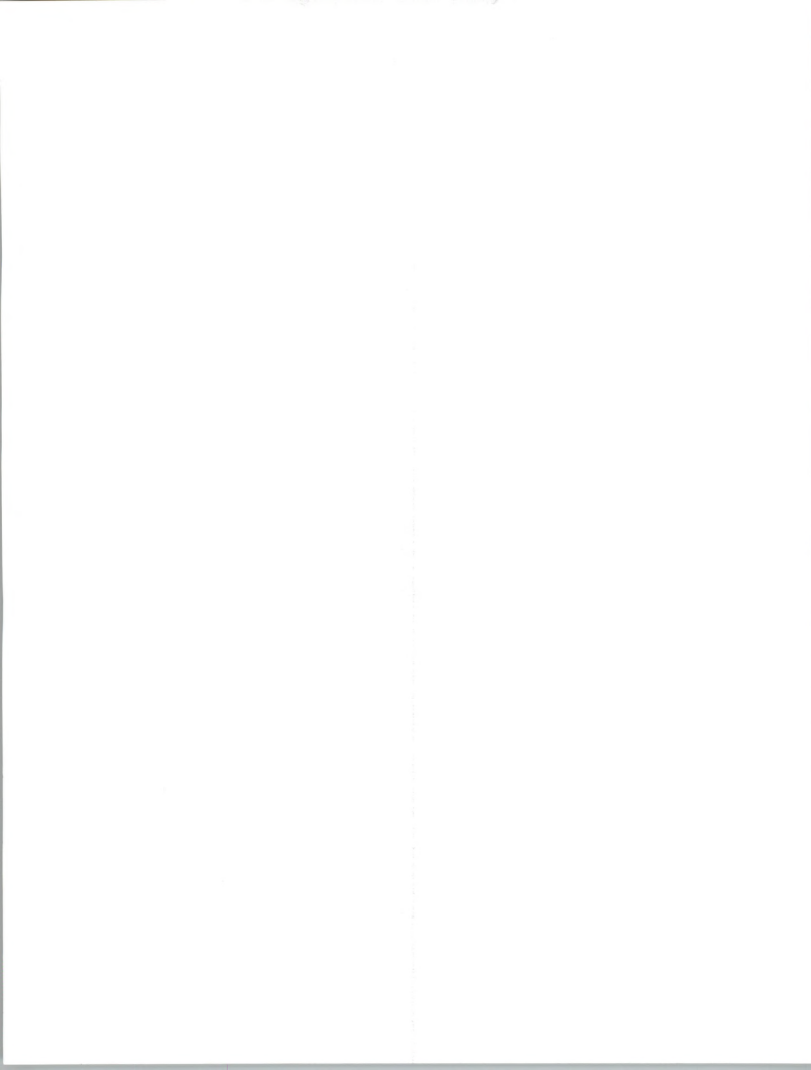


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Introduction

A

Purpose and Organization

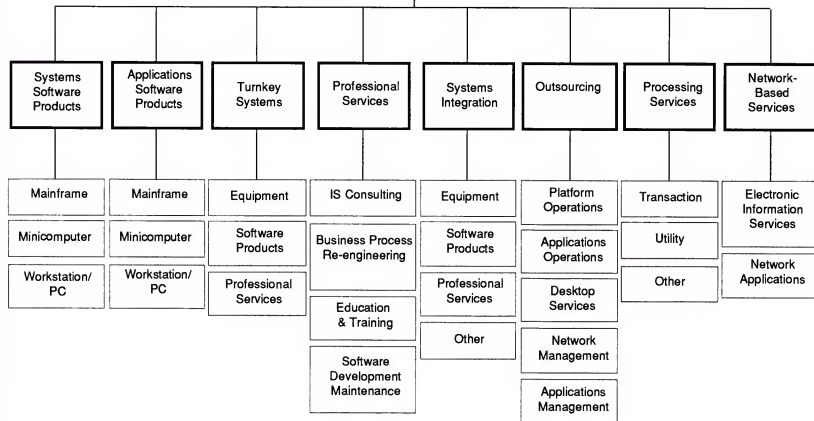
The 1994 Information Services Annual Report covers the full spectrum of information services markets in the United States. The report will identify and analyze industry trends, highlight technology developments and issues, scope current market size and provide five-year forecasts, identify leading vendors and their market shares and make recommendations for vendors and users of information services and products to maximize their opportunities in this dynamic market.

The information services industry has been tracked by INPUT continuously since 1974, during the years of dramatic growth. Although the industry has slowed in the last two years, the potential growth forecast by INPUT still makes this an attractive market for many vendors.

INPUT defines this market as shown in Exhibit I-1. The primary focus of this report will be on the "service/product categories (product/service markets)" shown at the top row of the exhibit.



Information Services Industry Structure – 1994





The report is organized as follows:

Chapter II provides an overview of the general business climate for information services, describes major driving forces and user issues, defines the overall market and its growth, identifies the largest vendors and their market shares and relates general conclusions about the industry.

Chapters III through IX cover individual service/product categories, in each case providing an expanded treatment of buyer issues, trends, forecasts, leading vendors and their market shares along with recommendations and conclusions.

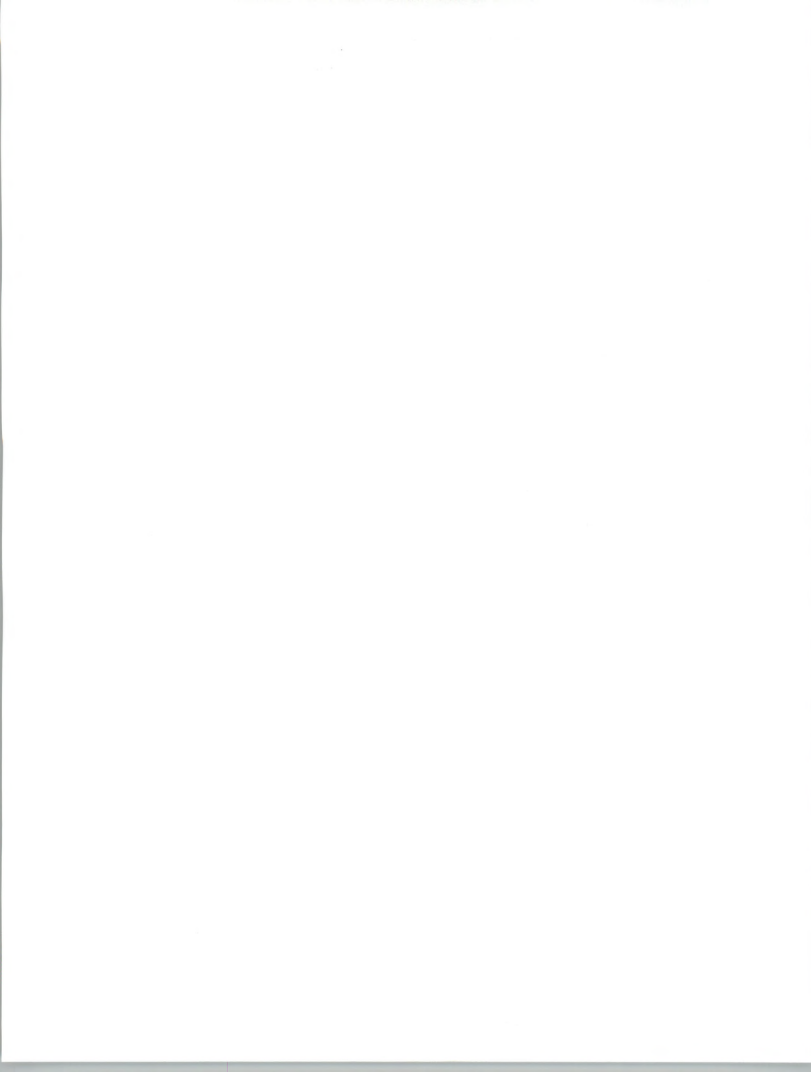
Readers should be able to gain a broad understanding of the forces at work in the information services industry, weigh potential market opportunities and risks and identify key service providers.

B

Scope

This report exclusively covers the United States Information Services Market. Obviously, there are major available markets outside the U.S., although this is still the largest country market, by a wide margin. Readers interested in comparable studies of international markets should consider the 1994 Worldwide Information Services Report, just released by INPUT.

INPUT also tracks fifteen vertical markets and seven cross-industry markets, annually reporting on them. These markets are not discussed in this study. See Section I-E for a list of those reports.



C

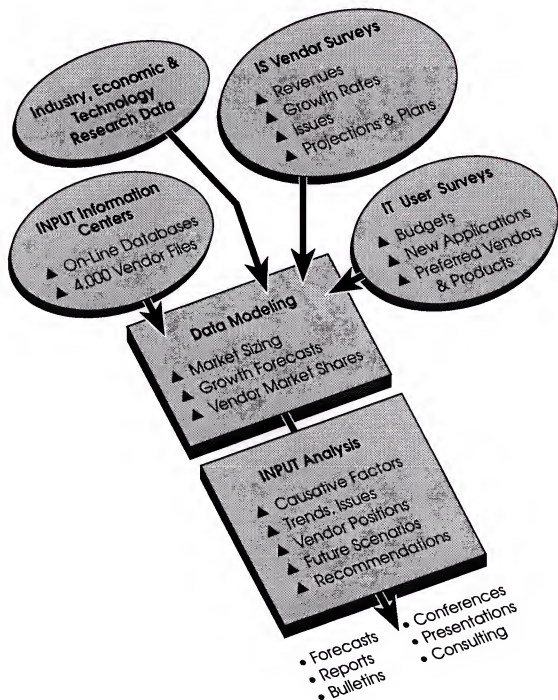
Methodology

INPUT's methodology for market analysis and forecasting is summarized in Exhibit I-2. As in past years, INPUT has continued to survey information services vendors to determine their U.S. information services revenues and query information systems organizations about expenditures and outside services acquisition plans. Vendors were interviewed a second time to understand their views of market opportunities over the short and long terms.



Exhibit I-2

INPUT Research Methodology





Ongoing Research - Much of the data on which this report is based has been gathered during 1993 as part of INPUT's ongoing market analysis program. Trends, market sizes and growth rates are based upon INPUT research and over 3,000 in-depth interviews with users and IS vendors serving all market sectors. INPUT maintains ongoing relationships with, and a database of, all users and vendors that it interviews. Interviewees for the research portion of this report were selected from this database of contacts.

Resources - Extensive use was made of INPUT's corporate library located in Mountain View, California. The resources in this library include on-line periodical databases, subscriptions to a broad range of computer, technical, scientific and general business periodicals, continually updated files on over 3,000 information services vendors and the most up-to-date U.S. Department of Commerce publications on industry statistics.

Forecast Estimates - Vendors, when responding to interviewers or questionnaires, may be unwilling to provide detailed revenue breakdowns by product/service market or industry. Also, vendors often use different categories of industries and industry segments, or view their services as falling into different product/service markets from those used by INPUT. Thus, INPUT must estimate revenues for these categories on a best-effort basis. For this reason, the product/service market and individual segment forecasts should be viewed as indicators of general patterns and trends rather than specific, detailed estimates for individual years.

Rounding - When displaying market forecast values in bar and column charts, INPUT rounds these amounts for ease of visual reference. Markets of \$1 billion or more are rounded to the nearest \$50 million; \$100 million to \$999 million to the nearest \$10 million; and \$50 to \$99 million to the nearest \$5 million. Actual values are shown in charts for markets of \$49 million or less, in Appendix A tables, and in chapter text.

INPUT's annual forecasting process is broken into two major parts: base-year expenditure calculations and market forecasts. Each is briefly described below.



1. Base-Year Expenditure Calculations

- INPUT determines previous-year information services revenues for the eight product/service markets and twenty-two industry and cross-industry sectors for hundreds of vendors. Estimates rely upon interviews, public data and INPUT's own estimates.
- The initial data is projected to represent the entire information services industry.
- Adjustments are made to eliminate duplications due to distribution channel overlap and assure captive information services expenditures are not included.
- The result is a base-year 1993 user expenditure for each of the twenty-two vertical and cross-industry sectors and the eight product/service markets.

2. Market Forecasts

- In the forecasting step, INPUT surveys information systems executives to determine their projected expenditure levels in aggregate and for each of the outside information services categories.
- In addition, a second set of vendor interviews is conducted later in the year to obtain an understanding of how key vendors view the market and its opportunities.
- The result is a five-year forecast for each of the twenty-two vertical and cross-industry sectors and the eight product/service markets.

To complete the process, INPUT reconciles its new forecasts with those from the previous year. Differences due to market restructuring and other factors are explained. One may use these projections to track INPUT's forecasts from year to year.



D

Economic Assumptions

INPUT forecasts are presented in current dollars (i.e., 1998 market sizes are in 1998 dollars including inflationary forecasts). In developing the five-year forecasts, INPUT has incorporated economic assumptions regarding the outlook for the U.S. economy as a whole (see Exhibit I-3).

The GNP and GNP Deflator growth rates used in INPUT's market projections for 1993 through 1999 are from the CONSENSUS™ forecast, Blue Chip Economic Indicators of Sedona, Arizona. The Blue Chip CONSENSUS forecast is derived from a panel of economists representing leading financial, industrial and research firms across the U.S. and has a 13-year track record of balanced and accurate projections.

Exhibit I-3

GDP and Inflation Growth Rate Assumptions, 1993

Overall	1993E	1994E	1995E	1996E	1997E	1998E	1999E	Avg. 93-98%	Avg. 94-99%
Nominal GDP	5.8	6.2	6.2	6.1	5.8	5.9	6.0	6.0	6.0
GDP Deflator	2.5	3.0	3.4	3.5	3.4	3.3	3.2	3.2	3.3
Real GDP	3.2	3.1	2.8	2.6	2.3	2.5	2.7	2.8	2.7

Source: Blue Chip Economic Indicators

E**Related Reports**

Related reports of interest to the reader are as follows:

- *Worldwide Information Services Forecast, 1993-1998*
- *Pricing and Marketing Professional Services, 1993*
- *U.S. Professional Services Market Analysis Report, 1993-1998*
- *U.S. Application Solutions Market Analysis Report, 1993-1998*
- *U.S. Network Services Market Analysis Report, 1993-1998*
- *U.S. Processing Services Market Analysis Report, 1993-1998*
- *U.S. Systems Software Products Market Analysis Report, 1993-1998*
- *U.S. Systems Integration Market Analysis Report, 1993-1998*
- *U.S. Systems Operations Market Analysis Report, 1993-1998*
- *U.S. Industry Sector Markets, 1993-1998* (15 reports on all major industry sectors, e.g., insurance)
- *U.S. Cross-Industry Sector Markets, 1993-1998* (seven reports on information services markets that serve all vertical industry sectors, e.g., accounting)

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II

Executive Overview

A

General Business Climate

Despite well-justified concerns about the painfully slow growth rate in the U.S. economy in 1993, information services industry vendors report the environment still offers significant opportunities, together with challenges, as indicated in Exhibit II-1.

Exhibit II-1

Impact of the Economic Environment

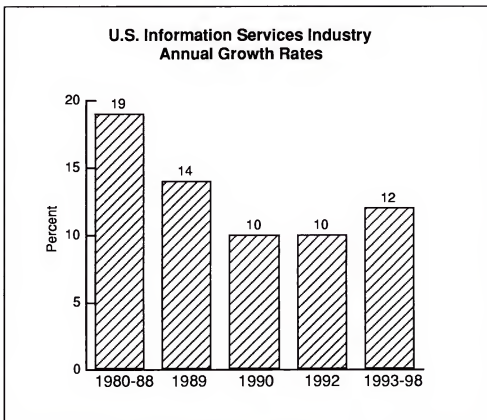
Factor	Impact on the Information Services Industry
Low growth as U.S. economy recovers from recession	Increasing need for application systems that can improve revenues and restructure business
Slower growth rate for U.S. information services industry	Likelihood of slower growth rates for vendors who pursue business as usual
Annual increase in information services business of over \$12 billion	Significant target for aggressive vendors in selected sub-markets
Foreign market opportunities and competition from foreign vendors in the U.S. economy	Need for information technology to increase product quality and customer services

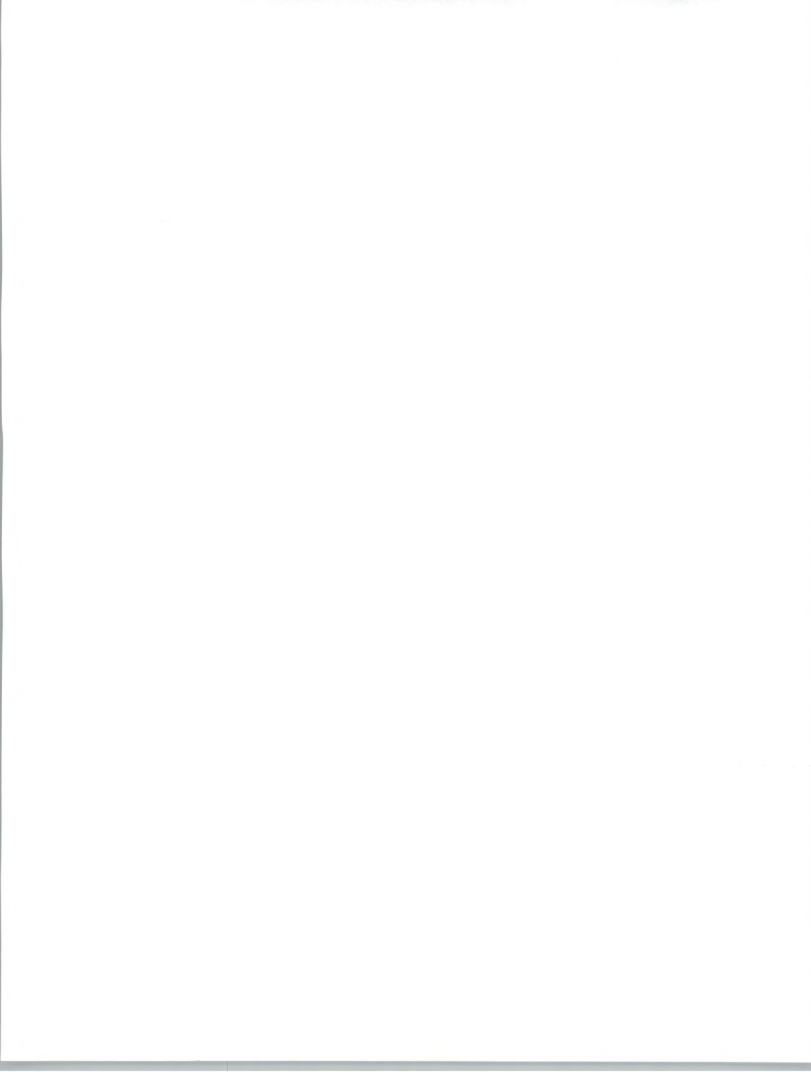
Of note are:

- The annual increase of business volume in the industry of more than \$12 billion, is making information services one of the more attractive areas of opportunity in the economy.
- Demands imposed by the low level of economic growth have led to vendor projects that strive to increase revenues through improved geographical analysis of sales coverage, and improved service and product quality through the use of client/server systems that enable users to communicate between functions more effectively.

The U.S. information services industry is growing at a slower rate in the 1990s than it did in the 1980s, as shown in Exhibit II-2. Although the industry is rebounding slightly from the recession, it is not likely to return to the growth rates of the early 1980s. Vendors cannot rely on a favorable growth climate to help many of their product and service initiatives.

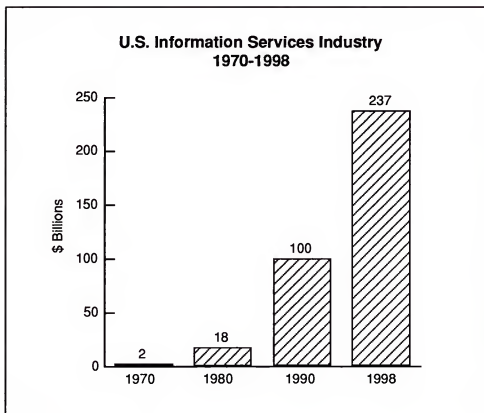
Exhibit II-2





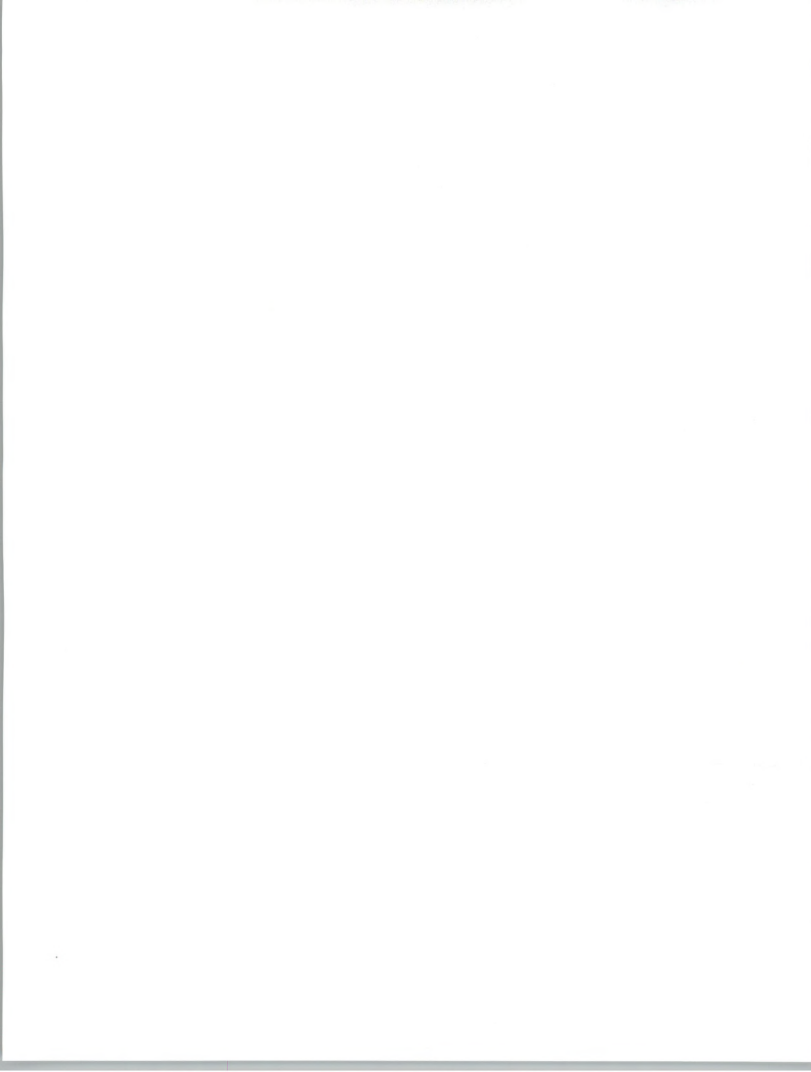
- As Exhibit II-3 shows, the industry increased in size over five times during the 1980s and is now 50 times larger than it was in 1970 when the industry represented \$2 billion in user expenditures.

Exhibit II-3



- By 1998, the U.S. information services industry is expected to grow to more than \$200 billion, with an annual increase in absolute terms to be in the \$15 to \$25 billion range.

High rates of growth for the sale of software products and professional services provided the impetus for growth during most of the last decade. As the rate of sales of these product/service markets declined, there were concerns about the continuing vigor of the information services industry; however:



- Growth of U.S. information services expenditures has been reinvigorated by the strong interest in outsourcing, restructuring, and downsizing business application systems, and by an increasing use of network services. In addition, there has been continuing growth in systems integration services.
- In effect, the information services industry has shifted from service-product sales to selling solutions to serve the customer's business needs for higher competitiveness and greater productivity.

On a worldwide basis, the industry continues to experience higher growth rates—close to 20%—and many U.S. vendors are experiencing growth overseas that exceeds that of the U.S. industry as a whole.

- This growth is primarily due to the relative stage of automation in many foreign markets, but the focus on specific industry markets in some countries is also a strong factor.
- Inflation rates and somewhat stronger economies have also helped to drive the global use of information services in the last few years, but these factors may have less of an impact at this time. In the Asia/Pacific region, for example, Japan and Taiwan, are experiencing economic instability which has affected the information services markets.

B

Market Forces

The set of market forces noted in Exhibit II-4 will continue to have an impact on the information services industry in 1994 and will also have a measurable effect on the overall growth rate for the five-year forecast period. Each force will affect the industry as a whole, as well as each of the product/service market sectors used by INPUT to analyze the industry and its key trends.



Exhibit II-4

**U.S. Information Services Industry
Primary Driving Forces, 1993-1998**

- Slow economic recovery
- Globalization
- Growing influence of large vendors
- Information superhighway
- Outsourcing (buy versus make)
- Shift in technology
- The changing buyer
- Convergence

1. Slower Economic Recovery

The first of these forces, the interaction of the economy with the overall size of the industry, is a significant factor in user expenditure levels for information services.

- Although improving economic growth is still slow and inflation remains low, causing less growth in industry sales due to price increases.
- Real economic growth, that had been modest prior to the recession in late 1990, will be low(though improving), during the forecast period. Blue Chip economic indicators forecast a nominal growth rate of 6.0% during the next five years but 3.2% of that is anticipated to be inflation-related, leaving a real GDP annual growth rate during 1993-1998 of 2.8%. Although this represents a 0.2% improvement over the 1992-1997 GDP growth rate, low growth may continue to defer plans for the expanded use of information services in many industry sectors.

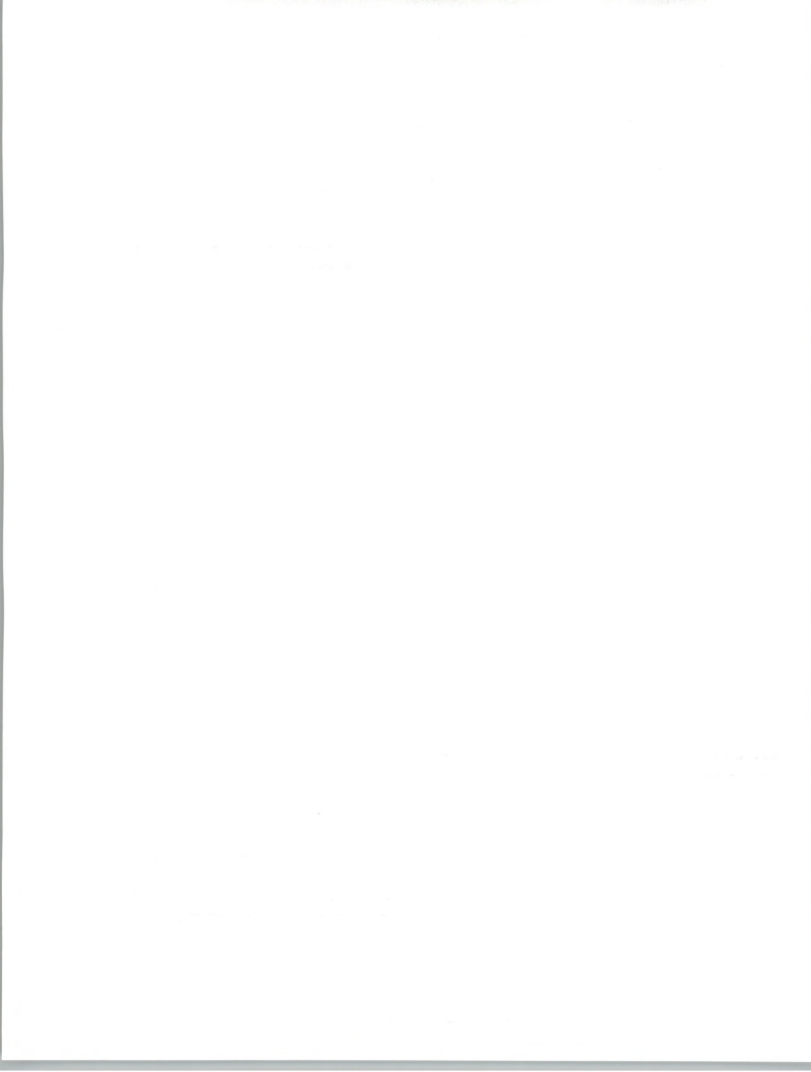


- The shift of information processing to smaller computers—encouraged by the economy as well as by the current cost and level of technology—has lowered the software products investment, based on current pricing practices. Quantities of software products sold will increase, but revenue levels will grow at more modest rates unless software products are sold together with professional or systems integration services where price might be increased in line with actual value.

1993 improved somewhat over 1992. Nominal GDP grew from 5.3 in 1992 to 5.8 in 1993, with inflation holding between 2-3%. However, the information services industry grew at an unchanging 10%.

The continuing slow, expected upturn will have the following positive and negative impacts on the U.S. information services industry in the near term:

- Positive impacts:
 - There is increased motivation to buy new information technology (IT) solutions rather than make them, in particular for larger systems requirements. Re-engineering and streamlining business processes are the key criteria supporting use of outside services.
 - The interest in outsourcing, which permits organizations to redeploy capital investments and lower direct staffing levels, is encouraged by slow economic conditions and the desire to control costs.
 - A tight economy is sustaining an interest in lower-cost solutions that come from client/server-based applications software products.



- Possible negative impacts:

- Continuing uncertainties in decision processes, although not as severe as in 1992 and 1993, will cause some delays or deferrals of major information systems projects.
- With tight constraints on external information services expenditures at some companies, management may decide to burden the internal IS staff with applications maintenance and enhancement and development assignments rather than use contracted professional services vendors. This would have a negative effect on a major segment of the industry.

2. Globalization

The second major market force, which INPUT has stressed for the past four years, is globalization. During that time, more markets have opened, vendors have expanded their international focus and users have begun to expect global capabilities.

The primary positive impact of globalization is that it enables the larger vendors to balance their businesses in multiple markets, which are less affected by market downturns.

The primary negative impact from globalization is that it may make it harder for smaller vendors to grow and/or maintain independence. Another negative impact is the lingering global recession, which has weakened economies in Europe and Asia, and thus affected information services markets.

3. Large Vendors

The third market force is the influence of larger information services vendors, that has grown significantly over the past three years.

- The newer systems integration and systems operations sectors, although smaller than the more traditional sectors such as professional and processing services, are growing faster than the traditional sectors and are dominated by the larger vendors. Major vendors are also driving the network services market, which, with a CAGR of 17%, shows the highest growth from 1993-1998.



- A number of the larger vendors are growing faster than the overall market, and these vendors have more opportunity, based on their resources, to enter (or acquire vendors in) desirable foreign markets.
- There are also numerous smaller firms that are growing faster than the general market, but larger vendors have a disproportionate opportunity to obtain bigger jobs and continue to add large amounts of revenue to their bottom line each year.

The influence of larger vendors is also increasing in other ways. Starting with IBM, many large services vendors are making minority and majority investments in IT firms to gain influence on technology and access to software products for remarketing and market share.

The opportunity for the smaller, more specialized software product or services vendors is not disappearing, but it is changing in character.

- Alliances with larger vendors has become crucial, at least as secondary sales and support channels.
- Specialization, in terms of the technology used or the industry served, or both, will become more important and common. Many companies are recognizing that "being all things to all people" may no longer be a practical provider strategy.

The continuing increase in the strength and impact of the larger vendors will have the following positive impacts:

- The larger vendors have the financial strength to mobilize resources for very large jobs, and minimize the risk of losing large contracts.
- The larger vendors have financial resources available to invest in new technologies, often through investment in smaller and specialized firms.

Smaller technology firms may need to form alliances in order to gain the same advantages larger firms have (as discussed above), and also survive. Larger firms, however, tend to move more slowly and this will hamper development and acceptance

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of new technology. The slowness will provide the opening to small vendors who seize technology initiatives. This is already well demonstrated in the client/server technology market, where numerous small software companies like Gupta, Powersoft & Popkin have gained substantive marketshares.

4. The Information Superhighway

From Capitol Hill to numerous Silicon Valley boardrooms, the information superhighway generated frequent, speculative debate in 1993. The discussion is unlikely to diminish in 1994, and will most certainly heat up as government agencies and private sector information services companies struggle to further define the superhighway, build it, and sell it to the American user.

Government regulation is the issue that lies at the heart of this grand plan. Fears exist about excessive government scrutiny that could significantly alter or delay superhighway implementation in much the same way the FCC delayed cellular phone use in the U.S. during the 1960s and 1970s. The opposite argument is *too little* government regulation could lead to multiple vendors implementing multiple standards—providing poor superhighway access and integrity for a confused user base.

Many vendors have announced, or are preparing, products and strategies for the information superhighway, including Microsoft and Oracle. In addition to software and services companies, telecommunications and cable television vendors are planning interactive television and other services for the superhighway. Ultimately, when and how this information superhighway becomes a reality is speculative. Nevertheless, it may well become the defining U.S. electronic infrastructure and presents numerous opportunities.

5. Outsourcing

Another significant market force is outsourcing (systems operations). The recession has encouraged more companies to consider outsourcing, and interest in it has grown from the outsourcing of the management of information systems (systems management) to other types of activity—such as solutions buying, applications maintenance and applications management.



- Applications maintenance—the around-the-clock support of applications systems and management. Contractual arrangements to manage the development and support of application systems are new means for using support from professional services vendors that provide more defined relationships and pricing.
- “Solutions” buying—is support for client/server technology where a vendor will provide software products and customization to satisfy the needs of a distributed environment.

6. Technological Shift

An additional market force is the shifting technology foundation as shown in Exhibit II-5. This influence is related to the developments that are adding complexity to, or shifting the technological basis for the use of information systems, including the following:

Exhibit II-5

New Technology Foundations

- International standards
- Business process re-engineering (BPR)
- Graphical user interface (GUI)
- Client/server
- Networking and integration
- Telecommunications
- Distributed databases
- Imaging
- Engineered/re-engineered software

- The international standards that must be considered when developing or buying software products in today's market, including the growing variety of “open systems” architectures.



- Business Process Re-engineering (BPR)—is of growing importance as companies focus on what software and systems can do to improve fundamental business needs.
- Graphical user interfaces—increasingly demanded by users of software products.
- Client/server architecture—the vehicle for downsizing application systems or portions of them for user environments.
- Networking and integration—provide the means for distributing application systems as well as linking company functions.
- Telecommunications—rapidly becoming a fundamental component of systems architectures.
- Distributed databases—necessary for distributed user environments, and support for client/server computing.
- Imaging—the inclusion of the entire source document in the information systems application.
- Engineered/re-engineered software products—will change the approach to the maintenance and enhancement of application systems.

These shifts will make it possible for solutions to be more closely tailored to user environments and company situations. They will also create a number of opportunities for vendors.



7. Changing Buyer

The final market force to consider is the changing nature of the buyer. The decision maker for the purchase of information services remained relatively constant until the late 1980s. It was the information systems executive and key staff (systems development and data center operations managers) who decided when to go outside and what company to contract.

This role has changed significantly in the past few years and promises to change even more. As the information services vendor moves to provide a long-term service or a full solution, the executive (in user functional areas) is becoming the buyer. The results are significant:

- Technology itself becomes less important as strategic business or operational impacts become more important. User access to applications and systems is emerging as a fundamental business need and therefore an important vendor focus.
- The impact of the information systems function becomes more consultative and less direct.
- The ability of functional managers to try new ideas and approaches is increased.
- Time to completion is controlled by the organization's ability to afford, not the constraints on the information systems group's ability to develop.

8. Convergence

The intended purpose of the information superhighway is to link every American household and office to a wide variety of electronic products and services. When in place, this highway would be the ultimate marriage of computer networks, telecommunications, consumer markets and user access and focus.



However, these elements are converging already, changing the ways information systems are designed and deployed. However sluggishly, personal digital assistants (PDAs) already combine wireless communications, computer networks and consumer electronics. Television has made its first interactivity forays through QVC and the Interactive Network.

Essentially, the information services trends that have been developing in American business over the last 15 years, are spreading into the wider commercial marketplace. This has created a larger market with a growing need for creative, innovative and practical technologies.

C

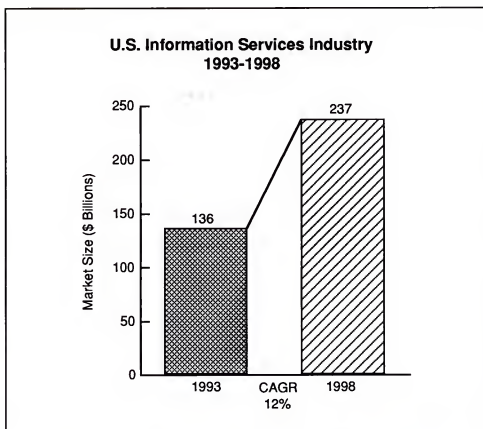
Market Size and Forecast, 1993-1998

Despite the lingering effects of the 1991-1992 recession, with its severe restrictions on capital investment and general spending on information services and systems, the U.S. Market still managed to grow at a respectable 10% rate during 1993. This is a tribute to the dynamic forces of change in the industry and the large number of innovative new products finding their way to market. While it remains a difficult, even perilous time for many marginal players, the industry as a whole will continue its steady growth, and a number of well-positioned vendors will succeed dramatically.

INPUT forecasts the U.S. market to grow at a CAGR of 12% during the next five years, as shown in Exhibit II-6, to a \$124 billion level in 1997. This means that real market growth in the later years of this forecast will be in the range of \$15-20 million each year, another indicator of the viability of the information services market.



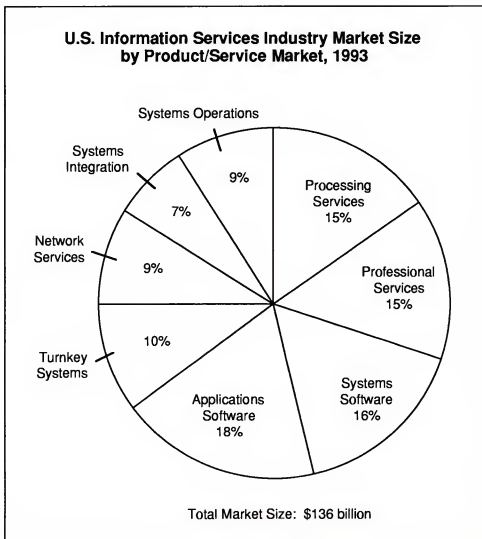
Exhibit II-6



Within the industry structure, there is considerable variation in the size and growth rates of the eight product/service markets covered by INPUT. Exhibit II-7 shows the relative size of each of these service/product sectors. The two software product categories, taken together, comprise one-third of the industry. The software industry is a very crowded field, with profit margins currently under strong downward pressure. The strong trend to client/server computing creates many opportunities for new software products within these environments. Also, the ease of vendor entry via sophisticated development tools employed on inexpensive PC/ workstation platforms continues to attract large numbers of new entrants and drive technology change at a fast pace.



Exhibit II-7



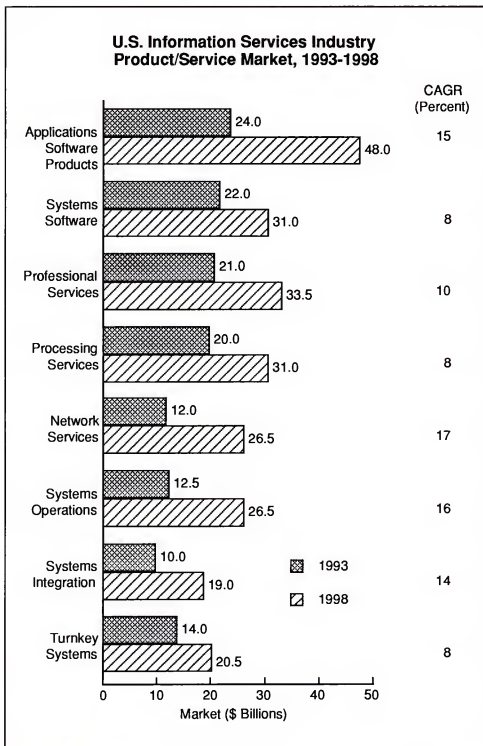
The smallest of the eight sectors—systems integration—represents a \$10 billion market today and has attracted considerable interest and publicity, as this approach continues to be used in the delivery of large, complex, multivendor systems to users.

Industry product/service market size and growth rates are shown in Exhibit II-8. Growth is strongest in network services, reflecting this sector's growing base and rapid expansion due to strong demand for database services, value-added networks and electronic commerce.



Lower growth is expected in the processing services market, which has been a stable, steady growth sector for some time, due to its large size, and niche orientation to delivery of solutions and services via vendor-owned facilities and systems.

Exhibit II-8





Similarly, the 8% growth foreseen for turnkey systems is a manifestation of the trend toward less costly equipment, and the decision on the part of many turnkey systems vendors to concentrate on software and services, leaving low-margin hardware to other distribution channels.

INPUT also categorizes the industry by its 15 vertical industry sectors. These are not treated in detail in this report, but it may be useful to present the largest vertical markets, plus those that are fastest growing, as points of interest. Exhibit II-9 identifies discrete manufacturing as the largest industry sector, a position it has occupied for some time. Continuing requirements to automate manufacturing processes and control systems will keep this market growing steadily during the rest of the 1990s.

Exhibit II-9

Leading U.S. Vertical Markets

Largest Vertical Markets	1993 U.S. Market (\$ Billions)
Sector	
Discrete Manufacturing	14.6
Banking and Finance	14.6
Federal Government	11.2
Highest Growth Vertical Markets	1993-1998 CAGR (Percent)
Sector	
Telecommunications	16
Retail Distribution	15
Discrete Manufacturing	14
Process Manufacturing	14



For the first time, banking and finance has tied discrete manufacturing in market size. The continuing pressures to reduce costs and provide fast, flexible customer service drives continuing growth in this market. Despite past problems of the savings and loan industry, plus cyclical problems in brokerage and securities firms, high demand for information services will continue.

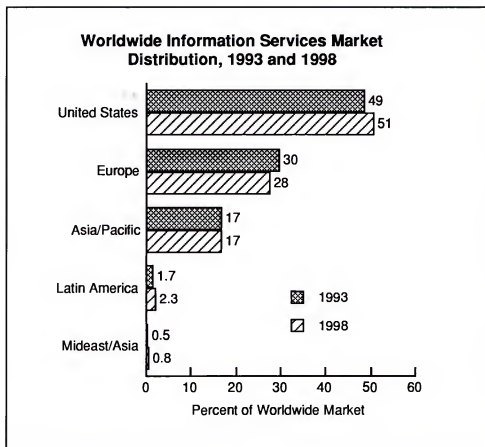
The federal government sector currently occupies the third largest spot, but with a significantly reduced growth rate over past years, as serious attempts continue to curtail federal spending in all categories.

Telecommunication, retail distribution and discrete and process manufacturing sectors are the fastest growth areas. Telecommunications is benefiting from the continuing investments of AT&T, the "Baby Bells" and other major telecommunications firms to position themselves to deliver high-technology capabilities and solutions to their own customers, through a wide variety of vehicles. Recent alliances between telecommunications vendors and media companies, such as cable operators, have also fueled growth in this sector. In discrete and process manufacturing, several factors are spurring information services growth. Business re-engineering and restructuring have increased the need for IS, as has competition for market share among vendors of manufacturing applications. Also, increased user knowledge of their business needs has driven the need for niche vendors and their expertise.

The U.S. market is still a healthy one, and growth here will exceed expansion in selected countries overseas. Exhibit II-10 shows that the U.S. portion of worldwide information services revenues will grow static, while Europe declines slightly and Asia remains static. But within Europe, there are still unpenetrated markets, particularly in the East, which are worth targeting. For more information on this subject, see INPUT's 1993 Worldwide Information Services report, which covers 30 of the largest country markets.



Exhibit II-10

**D****Leading Industry Vendors**

The information services market that consists of thousands of companies, most quite small, still has a sizeable set of very large and highly visible vendors able to exercise some degree of market power and control because of sheer size. This varies among the INPUT product/service markets, depending on the concentration of market share in each. When INPUT looks at the information services market as a whole, the leading vendors are those shown in Exhibit II-11.



Exhibit II-11

Leading Leading Information Services Vendors, 1993

Vendor	1993 U.S. Revenues (\$ Billions)	Market Share (Percent) Rounded
IBM	9.2	7
EDS*	4.0	3
CSC	2.2	2
ADP	2.1	2
Digital Equipment	2.0	2
Unisys	1.9	1
Microsoft	1.8	1
Andersen Consulting	1.4	1
Dun & Bradstreet	1.1	1
Computer Associates	1.0	1
Total	27.0	20

*Excluding GM

The world's largest computer company was still the largest information services vendor in 1993. In spite of financial turmoil, internal restructuring and a grim outlook for its main-frame market, IBM remains a company to reckon with. Software and services have grown to more than 40% of the company's revenue in the last two years, and IBM continues to concentrate on increasing these business segments.

With outsourcing and systems integration its top capabilities, EDS again ranked second among information services vendors. Although parent, General Motors, suffered some financial woes in 1993, EDS' noncaptive revenues in software and services



With outsourcing and systems integration its top capabilities, EDS again ranked second among information services vendors. Although parent, General Motors, suffered some financial woes in 1993, EDS' noncaptive revenues in software and services contributed well to a healthy bottom line. Since 1992, the company has successfully gained business in the manufacturing and telecommunications markets and been active overseas despite lingering recessions in Europe and Japan.

Third-place Computer Sciences Corporation continues its efforts to draw at least half its revenues from the private sector—although the company has been quite successful with federal contracts. However, through its commercial market subsidiaries, CSC has sought contract diversity by winning contracts in process manufacturing and agriculture markets, among others.

Client/server technology became a strategic direction and a product focus for Digital in 1993. In October, the company made perhaps its most important product announcement ever by introducing more than 170 new or upgraded products aimed at the client/server marketplace. According to Digital, the October announcement began with, what will become, an ongoing series of product and strategy announcements as the company moves further away from proprietary systems.

Andersen Consulting also holds client/server computing high on a pedestal, incorporating these methods into its systems integration, business process management and change management contracts. The move to client/server architectures further increased Andersen's Foundation CASE tool product suite, which has become one of the most popular and respected application development systems in the information services industry.



E**Summary**

The early 1990s have been a period of significant change from the 1980s. These changes suggest more modest rates of growth, but a sizable amount of growth in absolute terms. In addition, a number of opportunities and challenges could have a positive effect on vendors able to assume a proactive role in the changes taking place. For example:

- A 1993 market of \$135 billion, growing at a compound annual growth rate (CAGR) of 12% over the next five years, offers major opportunities.
- The increasing tendency of larger organizations to turn to vendors for IT services that include significant elements of systems management and have a solutions orientation, will lead to larger, longer-term decisions for vendor business.
- The major shift in the underlying technology foundation, especially telecoms and client/server computing, will create more valuable and productive application solutions. However, this shift will also necessitate re-engineering, reinvestment and retraining along with a demand for more time and money.

The role of the line executive (in user functional areas) concerning the deployment of information technology continues to increase and will become more important in regard to vendor selection over the planning period.





Professional Services Market Analysis

A

Market Trends

As Exhibit III-1 indicates, the performance of the professional services market in 1992 and 1993 has been slightly below INPUT forecasts, due mainly to the lackluster economic recovery. The recovery has also had selective benefits, favoring some industries and regions more than others.

- The actual expenditures of \$19.3 billion in 1992 are 1% less than the forecast made in 1992.
- The forecast for 1993 being made at this time is \$20.9 billion, 2% below the last forecast for 1993, made in 1992.
- The forecast for growth in user expenditures made for 1993-1998 is 10%—identical to the five-year forecast made in 1992.

Exhibit III-1

Professional Services Market Overview (\$ Billions)

<u>1992 Outlook</u>		<u>1993 Outlook</u>
1992 Forecast – 19.5	versus	1992 Actual – 19.3
1993 Forecast – 21.4	versus	1993 Forecast – 20.9
1992-1997 Forecast Growth Rate – 10% (CAGR)	versus	1993-1998 Forecast Growth Rate – 10% (CAGR)



INPUT analyzes the use of professional services and the other information services modes by examining expenditures in fifteen industry sectors and seven cross-industry sectors where services are delivered, as described in Appendix A.

An analysis of the performance of vendors is used to further investigate and confirm the expenditures of users. A wide range of firms are involved in the professional services business, and many of the vendors with the largest amounts of revenues from professional services, such as IBM and EDS, are chiefly involved with other products or services.

The user expenditures that INPUT classifies as professional services are activities devoted to the support of the use of information technology, including:

- Consulting
- Education and training
- Software development
- Application management

Boundaries cannot easily be placed around the professional services business. Companies in other industries such as Chubb Insurance and American Airlines (which owns AMRIS) can, and do, set up subsidiaries to offer professional services training, consulting, or design and programming. Professional services firms such as CSC can start to offer management consulting or turnkey systems delivery.

B

User Needs and Technological Factors

1. User Needs

The major user consideration driving the use of professional services continues to be the need for companies to improve the quality of their business, as shown in Exhibit III-2. This includes the quality of products and services as well as the quality of service for customers.



- Users in manufacturing, banking, distribution and other industries report they have had systems upgraded or developed to keep track of customer problems or information about customers that will enable service to be improved.
- A recent study on a portion of the utility market has revealed that over half of the users interviewed were upgrading their customer service capability.

In order to stimulate more business, users are also interested in installing and improving sales support systems. One large chemical manufacturer reported the use of a professional services vendor with a reputation in sales support to make changes to portions of office administration systems involved with sales activities and develop a system to improve planning for, and follow-up on, sales activities.

Exhibit III-2

User Needs and Issues

Needs/Issues	Average Importance
Improvement of customer service and product quality	4.2
Improvement of sales support	4.1
Improved connectivity: within and among organizations	3.9
The segmentation of application systems and data between user and IS systems	3.9
Re-engineering/restructuring business	3.8
Reducing and/or outsourcing functions	3.4

Other user issues of significance include improving connectivity internally and externally with customers and suppliers, the segmentation of applications and data among users and central systems, re-engineering and outsourcing or reducing functions.



- Connectivity continues to be an issue as the expansion and connection of LANs within businesses grows rapidly and linkage with suppliers and customers grows to meet distribution, manufacturing, banking and other needs. Users and IS are asking how much capacity must be built into networks and whether some pathways or access to data should be limited.
- The growth of connectivity and the flow of data is also leading to other issues. Users and IS are asking if planning should take place to segment data and application systems between users or if cooperative systems should be implemented. Steps are also being considered or taken to develop redundant data storage capabilities that can serve user needs.
- The issues discussed above, and other business considerations, are leading to the emergence of re-engineering and, specifically, BPR as a user issue, as discussed in the introductory chapter.

2. Technological Factors

Users are also increasingly affected by more complex technology, as noted in the general business trends mentioned in Exhibit III-4. The specific technological factors that are reported to be having the greatest impact on users are shown in Exhibit III-3.

- Client/server technology, complex network considerations, open system use and object-oriented technology are all reported as issues by users in relation to both downsizing projects and activities involved with the development of new client/server-based systems.
- The use or consideration of imaging systems is also rising in importance due to the opportunity to improve processing and lower costs, according to respondents. Improvements in technology—including software to manage image use—have also been reported that enhance the cost attractiveness and usefulness of these systems.
- Interest in multimedia is also rising, although most respondents do not report more than trial use.



Exhibit III-3

Major Technological Factors

Factor	Average Impact
Client/server expansion	4.5
Network expansion and complexity	4.2
Open system considerations	4.2
Object-oriented technology	3.7
Imaging systems	3.6
Multimedia	3.0
Use of small portable and "Newton" type products	2.3

3. Impact of Client/Server Technology

The high level of activity in client/server use illustrated in Exhibit III-4 indicates the level of interest respondents have in moving work to this technology or developing new systems for it.

- A recent industry study by INPUT found that more than 80% of a group of users planning new applications were planning to use client/server technology for implementation.
- There is also a high level of interest in obtaining software tools, aid and training for client/server technology, that provides opportunities for professional services and other vendors.
- Research by INPUT indicates that most expenditures for professional services will shift from mainframe to client/server platforms by 1998, as shown in Exhibit III-5.
- In addition to taking work from mainframe and midrange computers, C/S work will begin to orient much of the application work that is still done on larger computers, as illustrated in Exhibit III-6. For instance, a mainframe or midrange computer system handling a purchasing system might produce reorder information for a C/S system run by users.



Segmentation of applications or cooperative processing is also reported to be a means for users to improve productivity through the use of client/server systems.

Exhibit III-4

Impact of Client/Server Technology

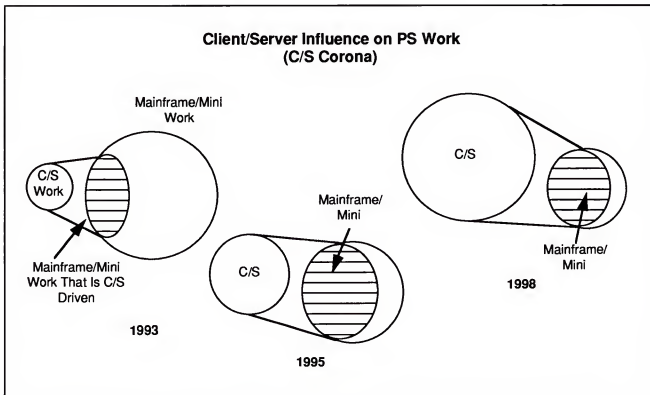
Impact of Technology on End Users	Average Importance to End Users
Downsizing or moving work to client/server platforms	4.6
Developing and modifying applications for client/servers	4.2
Obtaining client/server tools	3.8
Addressing network problems regarding client/server use	3.7
Seeking further training for client/server technology	3.7
Seeking technical aid with client/server use	3.6

Exhibit III-5

PS Expenditures by Target Platforms, 1992-1998

Platform	1992 (Percent)	1998 (Percent)
Mainframe	52	15
Client/server, workstation/PC	25	60
Midrange	21	15
Standalone open systems	2	10
Total	100	100

Exhibit III-6

**C****Driving Forces and Inhibiting Factors****1. Driving Forces**

It is not surprising that vendors report that the driving force with the highest impact on their work is the use of client/server technology, as shown in Exhibit III-7. Users are using or considering the use of this technology to downsize functions as well as to meet new needs.

- A number of small professional services firms report that they have developed expertise in one or more client/server applications or tools to meet market demands. New tools have started to appear that enable applications to be developed more rapidly for C/S, including PowerBuilder and FourGen.



- Major professional services/SI firms, such as Andersen Consulting, have developed specialized training and support capabilities for C/S.

Exhibit III-7

Professional Services Driving Forces

Force	Average Impact on Vendor
Growing use of C/S by end users	4.2
Need for improvement in quality of products and customer service	4.0
Need to improve sales effectiveness	3.9
Connectivity needs of users	3.9
- Intracompany	
- Intercompany	
Interest in re-engineering	3.6
Interest in imaging	3.3
Growing interest in application management	3.2
Open systems	3.0

Vendors also report that user interest in improving product and customer service quality, sales effectiveness and connectivity are major driving forces.

Re-engineering and the use of BPR are increasing in importance as a driving force because many users—not only the larger firms that initiate BPR consulting work—are engaging in steps or planning to restructure or “re-engineer” activities before initiating professional services jobs. Also, larger vendors such as EDS, Andersen, Deloitte & Touche and Price Waterhouse are suggesting to users that the use of new technology such as imaging or C/S should be preceded by the consideration of re-engineering.

Growing interest in continuing support by vendors—as in application management arrangements—is growing, although contracts of this type are not numerous. The profile of a representative contract for this service is shown in Exhibit III-8.

Exhibit III-8

**Profile of a Representative Application
Management Contract**

- Value \$2 million over three years
- Covers all commercial applications
- COBOL predominant language

Open systems is still felt to be a driving force, particularly with increasing connectivity and the possibility of moving applications to different platforms, segmenting applications or using cooperative processing. However, open systems is not as weighty a factor as it has been in the past. It is currently one of a number of related issues.

In addition to the forces driving actions of professional services vendors, the factors favoring the selection of certain of these vendors by users should be considered. As indicated in Exhibit III-9, these factors are led by the ability to provide help with C/S activities.

- The ability to market to users and to work with users and IS are also highlighted as factors that influence the selection of vendors. These factors also pay testimony to the increased importance of users and the fact that they are learning to work separately, as well as with IS departments on projects.
- Another factor that influences selection is the ability of vendors to promote an image of value. Users are interested in the question of value (applications that have fewer problems, are easy to use and can be upgraded), but even some of them state that the values a vendor offers have to be pointed out and emphasized. Unless an image of value is established, selection may only be made on price and past accomplishments.



Exhibit III-9

Factors Favoring the Selection of Vendors

Factor	Average Importance to Users
Availability of client/server skills	4.4
Ability to market to end users	4.2
Availability of client/server high-level training	4.1
Projecting an image of value	3.9
Ability to work with IS and users	3.7

2. Inhibiting Factors

As indicated in Exhibit III-10, factors that can inhibit the use of vendors in an assignment are led by the weak condition of the economy at present, and tight budgets within organizations.

- This situation has made the consideration of cost reduction and alternate sources more important. Users or IS may opt to make agreements with ex-employees or temporary personnel to do piecemeal work to meet needs rather than engage a vendor to do a more complete job.
- Internal consulting organizations may be called upon rather than vendors for the same reason, even if they do not possess needed skills.

Shortages of critical technical skills may inhibit the use of external vendors to a greater extent than some firms realize. The vendors may not be prepared to provide aid or answer questions about the C/S tools and other software products to which users have become committed.



Exhibit III-10

PS Market Growth Inhibitors

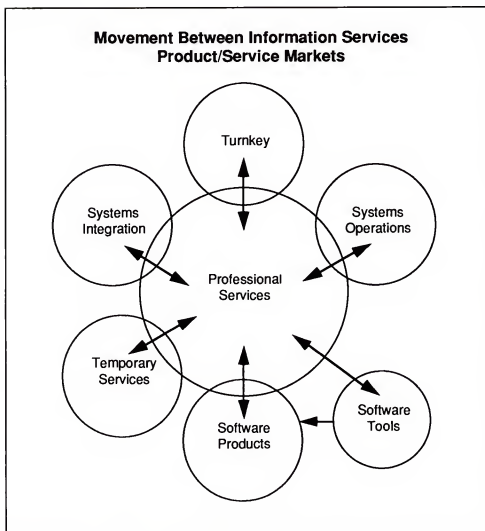
Inhibitor	Average Impact on Users
Weak economic recovery	4.1
Tight budgets	4.0
Competition from other types of vendors	3.8
Shortages of critical technical skills	3.7
Use of ex-employees, single contractors and temps	3.6
Internal consulting organizations	3.0

Professional services vendors can also find that other types of vendors are inhibiting their growth.

- SI and SO vendors may use available resources to bid for professional services jobs at companies for which they are doing work.
- Software and turnkey vendors may take on jobs to modify software products and even hire temporary personnel to do some of the work.

Because professional services skills are used in other information services product/service markets, vendors in those sectors find it easy to move into professional services work, as shown in Exhibit III-11, when business is tight or an opportunity appears.

Exhibit III-11



3. Billing Rate Issues

- Competition from other sectors is one of the factors putting pressure on professional services billing rates, as illustrated in Exhibit III-12.
- Competition from major SI and Big 6 vendors also puts pressure on rates because many users are willing to pay more for these firms based on their names, but expect to pay other vendors less.

Systems personnel who have been released by large companies, as well as temporary personnel, also put pressure on rates by providing services at low prices.



The greatest pressure on billing rates comes, however, from the media focus on "easy" C/S solutions, and the expectation that the use of new C/S technology will involve low-cost means of addressing problems.

Exhibit III-12

Factors Having an Impact on Billing Rates

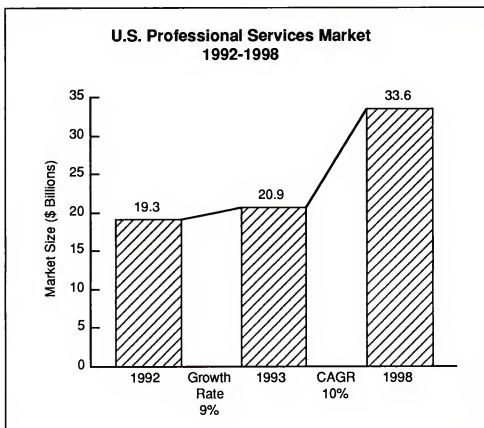
Factor	Average Impact
Media focus on "easy C/S solutions"	4.2
Cutbacks of senior personnel who can contract for services	4.1
Using "temporary services firms" for high-level IS skills	3.9
Low-cost expectations for modifications needed to meet requirements	3.8
Trade-off—users will pay more to Big 6 or SI vendors and expect to pay others less	3.8
Competition from other delivery modes	3.5

D**Market Size and Forecast, 1993-1998**

The annual growth rate for professional services expenditures has been hovering between 9% and 10% in 1992 and 1993 because of the slow recovery, and should stabilize at 10% for the five-year period between 1993 and 1998, as illustrated in Exhibit III-13.



Exhibit III-13

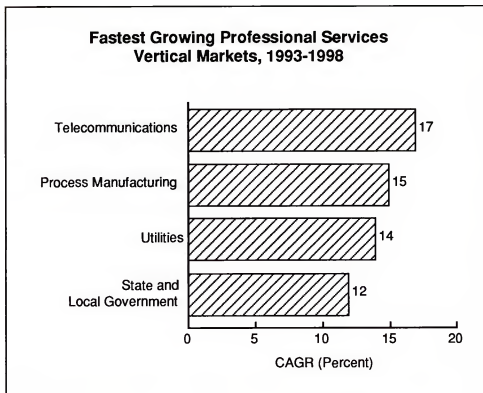


Forecasts of the fastest growing vertical markets during that period are shown in Exhibit III-14.

- Telecommunications will lead in compound annual growth rate (CAGR), due to the continuing expansion of business and personal communications requirements, and the demand for upgraded and new communications systems that is now being generated.
- Growth in process manufacturing will be stimulated by the introduction of application systems more tailored to the process business, as well as the demand for improvements in product quality and customer service.
- The state and local government market is growing at a relatively fast rate because of continuing demand for more public services, although its growth rate is not as high as forecast earlier, due to current constraints on funding. However, it has become the second largest market, and is spurred by this sector's dependence on outside consulting for much of its work.

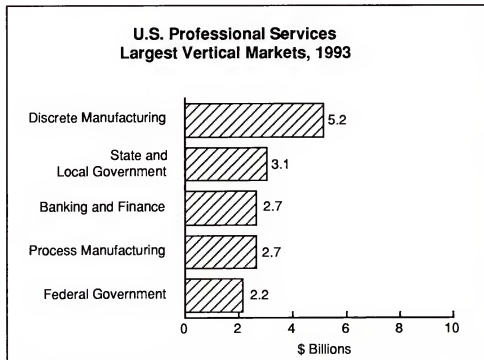


Exhibit III-14



The largest vertical markets are identified in Exhibit III-15.

Exhibit III-15





An analysis of professional services expenditures by functional area, shown in Exhibit III-16, reveals some changes between 1991 and 1992. There is a 1% larger percentage of expenditures in logistics/distribution and IS/telecommunications, and a 1% smaller expenditure in manufacturing/business operations and accounting/administration.

- Expenditures in logistics/distribution have been driven by business needs to be more responsive to clients, as well as desires to control costs in these functions more effectively.

Exhibit III-16

**Professional Services Expenditures
by Functional Area, 1992**

Functional Area	Expenditures (\$ Billions)	Percent of Market Total
Manufacturing/business operations	5.3	27
Accounting/administration/office operations	4.1	21
IS/telecommunications	3.5	18
Logistics/distribution	2.9	15
Research and development	1.4	7
Sales and marketing	1.4	7
Human resources	0.4	2
Other	0.4	2
Total	19.3	100



E**Vendor Competition**

The major vendors of professional services in the U.S. are identified in Exhibit III-17.

- Fewer than 35% of the firms listed in Exhibit III-17 are devoted chiefly to professional services.
- Computer manufacturers, including IBM, DEC, Unisys, AT&T and HP, stand out as a group among the leading providers of professional services.
- The top 25 firms include Andersen Consulting and four other members of the Big Six, including Ernst & Young, Coopers & Lybrand, KPMG and Deloitte and Touche. The remaining member of the Big Six, Price Waterhouse, concentrates a greater percentage of its business on systems integration (SI) and software products.

IBM, CSC, EDS and Andersen led the list of professional services vendors during 1990 and 1991. Unisys and DEC moved up into the third and fourth positions during 1992.

- The average revenue of the first six firms grew at a rate about 20% higher than other firms in the top 25 during 1992.
- Although these six firms are the leading vendors of professional services, they all gain greater amounts of user expenditures from SI and/or outsourcing operations.



Exhibit III-17

Major U.S. Professional Services Vendors, 1992

Rank	Vendor	Professional Services Revenues (\$ Millions)
1	IBM	645
2	CSC	625
3	EDS	560
4	Unisys	440
5	DEC	410
6	Andersen Consulting	375
7	Logicon	274
8	PRC	242
9	Hewlett-Packard	235
10	ATT	225
11	CTG	219
12	NYNEX/AGS	208
13	Ernst & Young	198
14	CGA	180
15	A.D. Little	160
16	Coopers & Lybrand	155
17	BDM International	147
18	McKinsey	137
19	Grumman	125
20	Analyst International	124
21	Martin Marietta	120
22	NETG	115
23	Deloitte & Touche	103
24	Computer Horizons	102
25	Keane	99
26	KPMG	98



- Larger providers of professional services among the top 25 are more likely to be interested in obtaining large, complex SI or outsourcing (systems operations) jobs, or even management consulting projects such as BPR, than in seeking out professional services work because those broader assignments could have higher billing rates and might entail more work.
- Smaller providers among the top 25, such as Keane and Analysts International, are more likely to have a greater percentage of their resources devoted to obtaining professional services work, including the supply of contract programming services.
- Still smaller firms, such as Trecom or Comtex, devote most of their attention to obtaining contract services work.

The larger vendors obtain many of their professional services assignments from clients to whom they are selling or have sold other products or services, including IT equipment, SI or SO services, or software products. The larger vendors also obtain professional services work from prospects who feel that certain needs are critical or require the highest quality.

- The image of quality enables these vendors to charge a premium price for services as well as to be selected for critical jobs.
- Smaller professional services vendors must attempt to establish a comparable image of quality in order to avoid being judged solely on price and past assignments. Successful completion of jobs and testimonials from satisfied clients are very useful in this strategy.

Some vendors do not analyze the factors that are important in establishing an image of quality, and thus fail to put together presentations on capabilities and demonstrations that larger firms have used successfully.

Most vendors of professional services concentrate on obtaining business from a set of vertical markets. One market that a number of the top vendors have concentrated on in the past is the federal government. This has become a serious issue to many vendors because government work is decreasing in many areas.



- Vendors such as BDM, PRC, Martin Marietta and GTE (Centel) currently depend on the federal government to a much greater extent than do other top vendors.
- EDS, IBM, and CSC have been major vendors in the federal market as well as the nonfederal market, and are in a better position to reallocate their resources into the commercial world.

Markets that are of much greater interest today, due to their size and/or growth rate, include banking/finance, manufacturing, telecommunications and state and local government. The top six vendors have business in all or most of these vertical markets.

F

Conclusions and Recommendations

1. Conclusions

Although recovery has been weak, current business conditions are creating selective opportunities for professional services firms in process manufacturing, telecommunications, banking, state governments and niches of other industries.

- Large systems integrators and outsourcers are engaging in intense research to target industries, niches or even specific firms that can offer substantial opportunities (in their own SI/SO specialties or in professional services), as noted in Exhibit III-18.
- These large vendors have also developed strong presentations that emphasize the benefits they can achieve, their ability to introduce new technology and techniques and reasons why their methods are more reliable and suitable for solving problems.

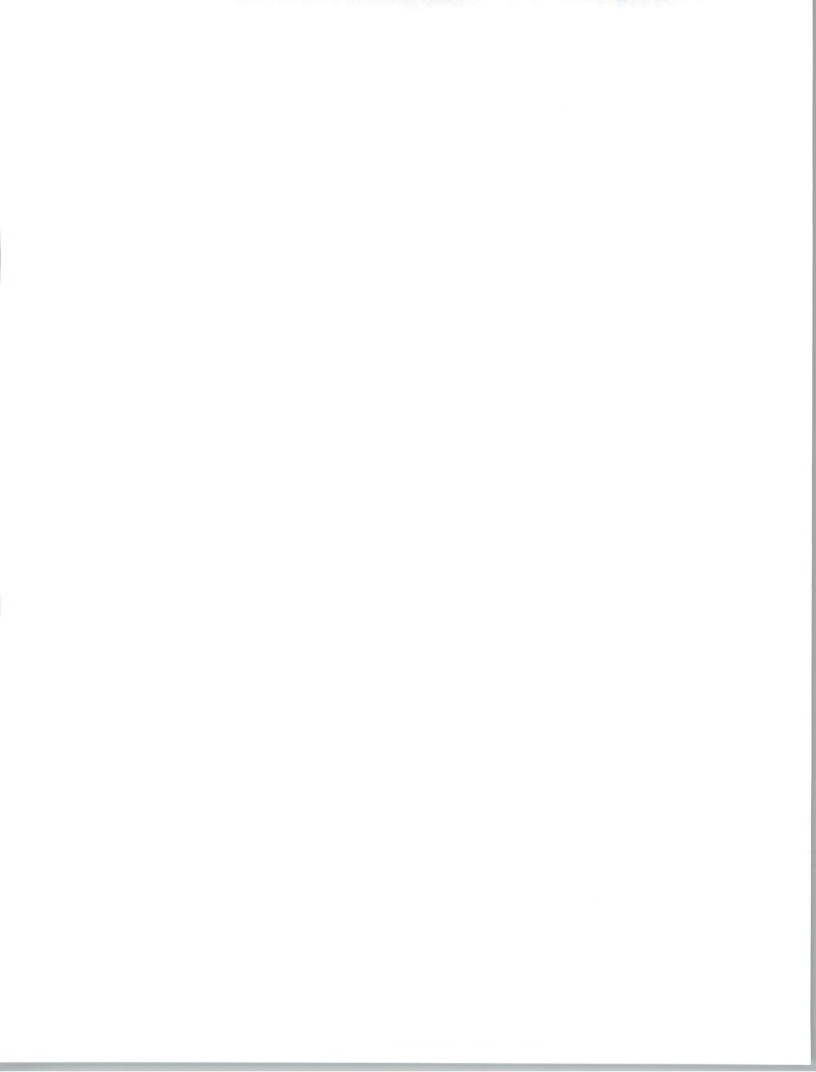


Exhibit III-18

Conclusions and Recommendations

• Conclusions

- Large systems integrators and outsourcers are targeting bigger prospects/deals.
- Pressure on midsized and small firms will intensify.
- Specialties or niches may be the path to growth or a trap.
- Alliances or mergers can be valuable, but benefits may be elusive.
- Professional services vendors must create an image of value as well as capabilities to gain profitable business.
- Technology will create new opportunities for professional services vendors.

• Recommendations

- Don't offer professional services alone
- Create an image of value
- Focus on client/server
- Anticipate opportunities emerging from the use of new technology
- Perform more market research

SI and management consulting firms associated with IT work are also launching consulting initiatives such as the current drive to BPR that can lead to substantial projects that large SI firms have the only or best opportunity to win.

The need to create an image through presentation of capabilities is crucial in competing for many other projects. Professional services vendors will find that they are forced into competition based on price if they cannot demonstrate expertise in technology and/or industry/application knowledge of interest to prospects. Examples of companies demonstrating this expertise are:

- Cambridge Technology has used a prototyping and rapid development capability to gain attention and work.

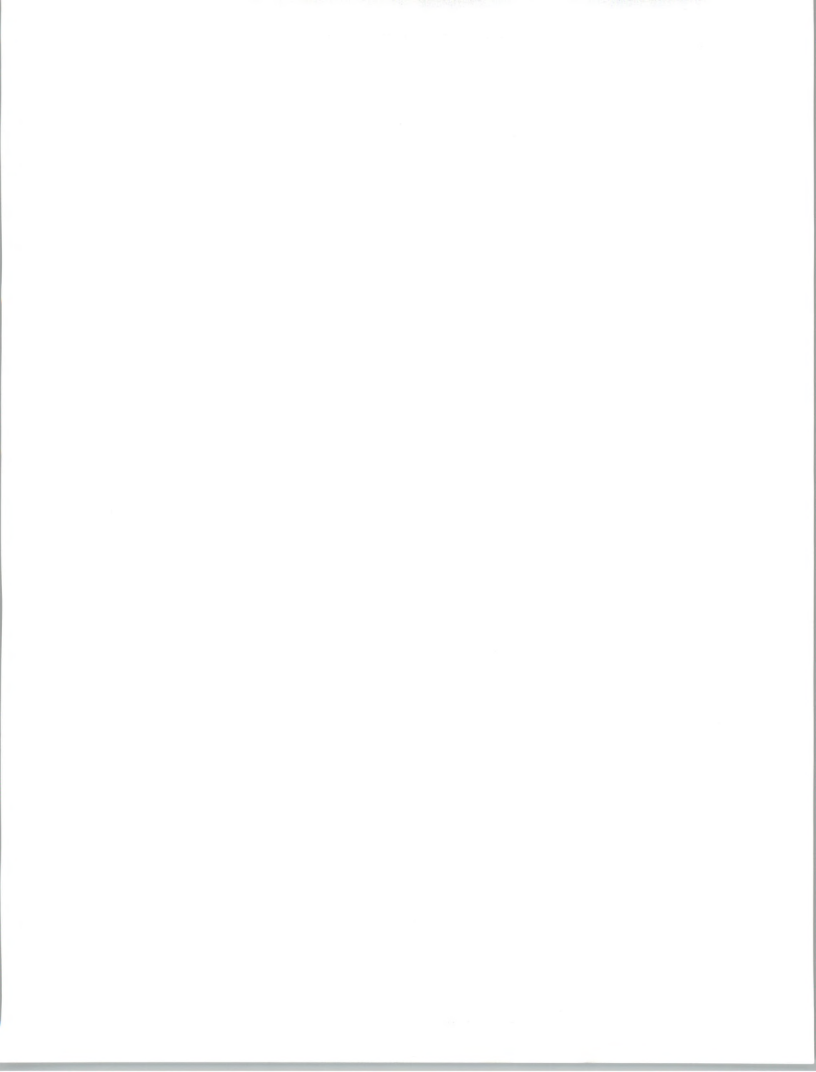


- IMI has introduced a development capability called SASM that has been successful in promoting the firm as well as gaining assignments.
- Comtex and DataArchitect have used their in-depth knowledge of banking applications to gain significant professional services work.

It is equally important for small vendors to gain niches of expertise. Excel Partners has done this by developing contract service expertise in client/server tools and application products, and the Cobre Group has achieved a position in automated application planning for manufacturing systems.

- Some vendors may find that their areas of expertise suffer from industry conditions or changes in the use of technology, as Continuum has found in insurance and several firms have found in ventures associated with CASE. There is no assurance that today's strength will apply in tomorrow's market.
- Vendors may also find that alliances or mergers with firms that have technical or industry expertise, such as SAP in manufacturing, do not always guarantee success. Nor have alliances with major hardware vendors brought consistently good results.
- Vendors may find, too, that they gain insufficient recognition for their expertise to command higher rates or be considered for better assignments. As discussed in Chapter V, there are firms of a moderate size, among the top 25 or 35 professional services firms, that are forced to compete primarily on the basis of price.

Pressures on the rates charged by professional services firms are also created by ideas generated in industry publications which report that use of C/S is resulting in lower development costs. Such pressures have also been applied by the increase in one-person and temporary-position firms. In addition, large SI firms have applied methods of lowering rates in order to gain contracts such as using temporary people with low rates or doing work off shore.



For mid-sized and small firms, competing principally with price increases the risk that jobs will be done at a loss. Also, developments such as factory-like methods of software development, object-oriented technology or the use of foreign resources will cause more jobs to be bid at low rates in the future.

The large SI and other vendors who command high prices for professional services and other work have not only carefully developed capabilities that have significant current appeal (as Andersen Consulting and EDS have done in C/S projects, imaging applications, BPR work, and knowledge of improvements in process manufacturing and other markets), they have also developed an image of value through carefully developed presentations and demonstrations.

Mid-sized and smaller vendors must develop similar expertise and specialties to survive, and a means of engendering an image of value in order to prosper.

The possession of focused expertise is also needed to uncover and take advantage of opportunities. For instance, the surge in use of C/S technology is leading to increasing demand from users for customization and modification of existing systems for C/S architectures, and development of many new ones.

- This type of work will constitute a growing opportunity for professional services vendors. (New firms with tools such as FourGen or access to personnel with C/S skills are already emerging.)
- The vendors who obtain a worthwhile share of the developing market will have built technical expertise as well as the ability to project an image of the value they can bring to those assignments.



The chief recommendation, as indicated in Exhibit III-18, is *not* to offer professional services, to avoid being classified as solely a professional services vendor.

- Have a recognized combination of SI, SO, professional services and possibly other IT work that will offer more opportunities to gain work and help create more of an image of value that can support higher rates.
- Don't promote yourself as strictly a professional services firm even if that is all or most of what you offer. Promote your consulting ability, knowledge of recent technology, understanding of industry niches or, most importantly, how your capabilities can improve the productivity and bottom line of your clients.

The offerings, advertising and promotion of a vendor must create an image of value, not only to win jobs or gain higher rates for work, but to eliminate price competition by making prospects feel that vendors who deliver value are preferred.

The use of C/S technology must be closely tracked because a high and increasing percentage of system projects will utilize C/S.

- Most non-C/S systems will involve interconnection or interaction with C/S systems, according to respondents.
- Users are going to be demanding that more work be done on C/S applications.

More research must be carried out on the market in order to identify opportunities in industry niches and emerging technology and techniques that can generate business.





Systems Integration Market Analysis

A

Major Buyer Issues

1. Overview

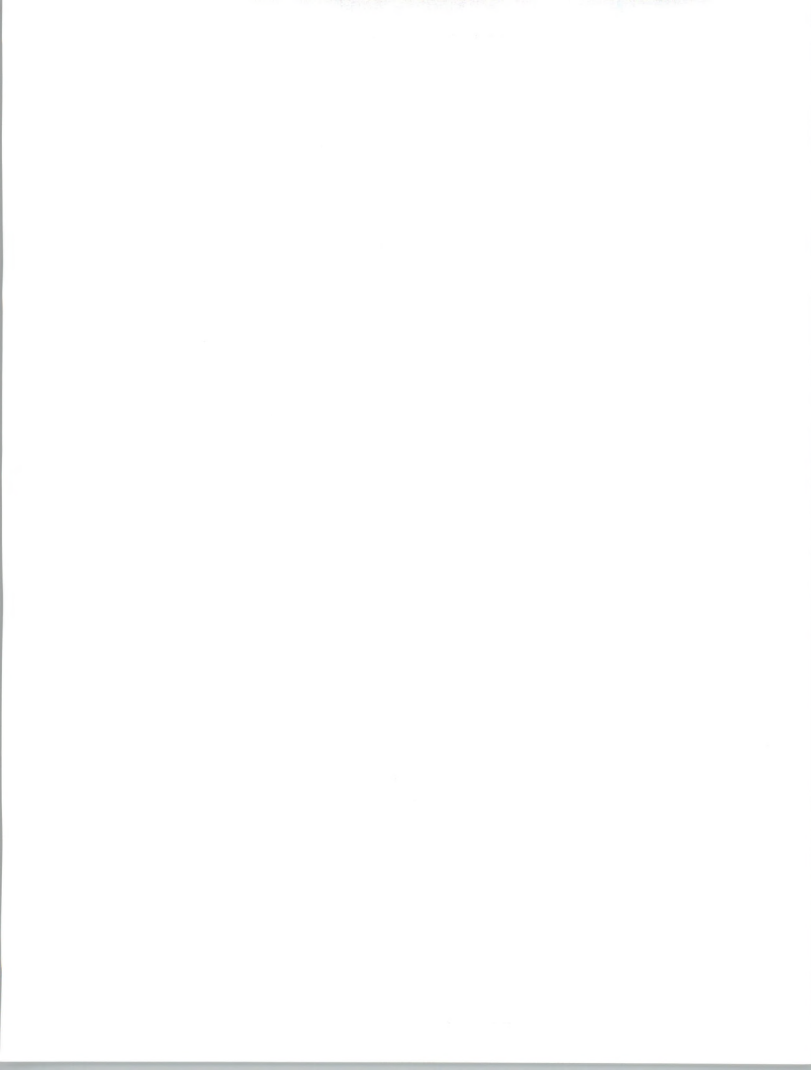
Both SI vendors and users report there are certain factors likely to encourage the use of systems integration (SI). Several vendors reported they consider these factors in order to predict the likelihood of SI contracts.

- A group of factors are related to user needs and issues, whereas, others are more general or technological in nature.
- Several of the factors are sufficiently important to users to make them evaluate vendors based on their capabilities in relation to the issues involved.

The following material discusses these factors in regard to user needs and other issues.

2. User Needs/Issues

As shown in Exhibit IV-1, the primary reason that encourages the selection of an SI vendor, is the need to solve problems associated with complex and/or large scale business processes such as materials management in manufacturing or utilities or commercial loan administration in banking.



- There are certain processes in each industry or vertical market that have become prime targets for SI solutions. A group of major SI vendors are continually analyzing other processes in order to identify the potential for new solutions in markets of interest.
- If an SI vendor identifies and provides a new or upgraded solution for a complex process, other organizations in the same industry are usually interested in this solution as Andersen Consulting illustrated with its recent solution to the process of reconciling ticket sales and ticket usage.

Exhibit IV-1

Needs/Issues That Drive Use of SI

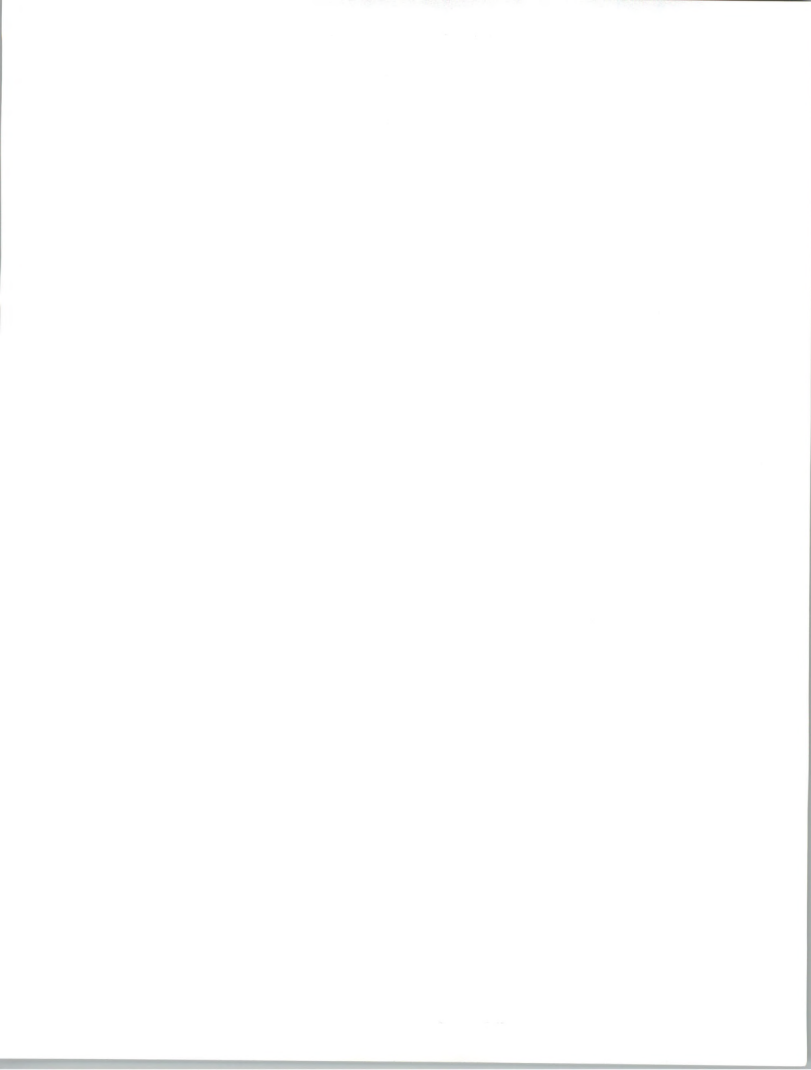
Needs Reported	Average Importance*
Solution involving complex industry processes	4.1
High level of connectivity	4.0
Need to steer client/server plans	4.0
Use of key new technology	3.8
Restructuring of re-engineering	3.7
Vendor skills can solve application problems	3.5

*5 = high, 1 = low

Only a small number of firms trying to increase their SI business are intensely active in this type of research, but they are vendors with large volumes of SI work, in general.

Among other needs and issues that drive the use of SI are high levels of network usage and/or connectivity between offices or processes in a company as noted in Exhibit II-1.

- This was reported to be the case in large-scale order entry and trading and manufacturing projects handled by SI vendors.
- Users report only a few SI vendors were prepared to meaningfully discuss their network needs, however.



The likelihood that new technology, particularly network technology, will be required to solve application problems is reported to be a major need that will demand an SI solution.

- An energy company and two large banks that have installed imaging systems were among the organizations that felt SI was required to deal with new technology.
- Several manufacturing concerns noted the expertise of SI vendors was needed to deal with their uncoordinated growth of client/server systems.

The need for re-engineering of business processes was also identified as a sign that systems integrators would be needed to accommodate the changes to, or replacement of, existing systems.

Finally, an argument for the use of SI vendors to solve an application problem is a desire to rely on the specialized skills of SI vendors rather than add specialized internal personnel for projects. This was mentioned as a project-related need or issue, but is closer to the use of SI.

B

Market Size and Forecast, 1993-1998

1. Recovery of U.S. SI Market

Due to the slow recovery from the recession during 1992 and early 1993, the SI market only showed a growth of 9% in 1993.

- However, the economy began to show more healthy signs in the second half of 1993.
- Users began to show more interest in projects that could improve their sales, earnings and productive capacity.
- Users are forecasting a more robust 14% CAGR for SI expenditures from 1994 through 1998, that will result in a level of \$19.3 billion, almost double the 1993 base of \$10 billion in expenditures as shown in Exhibit IV-2.

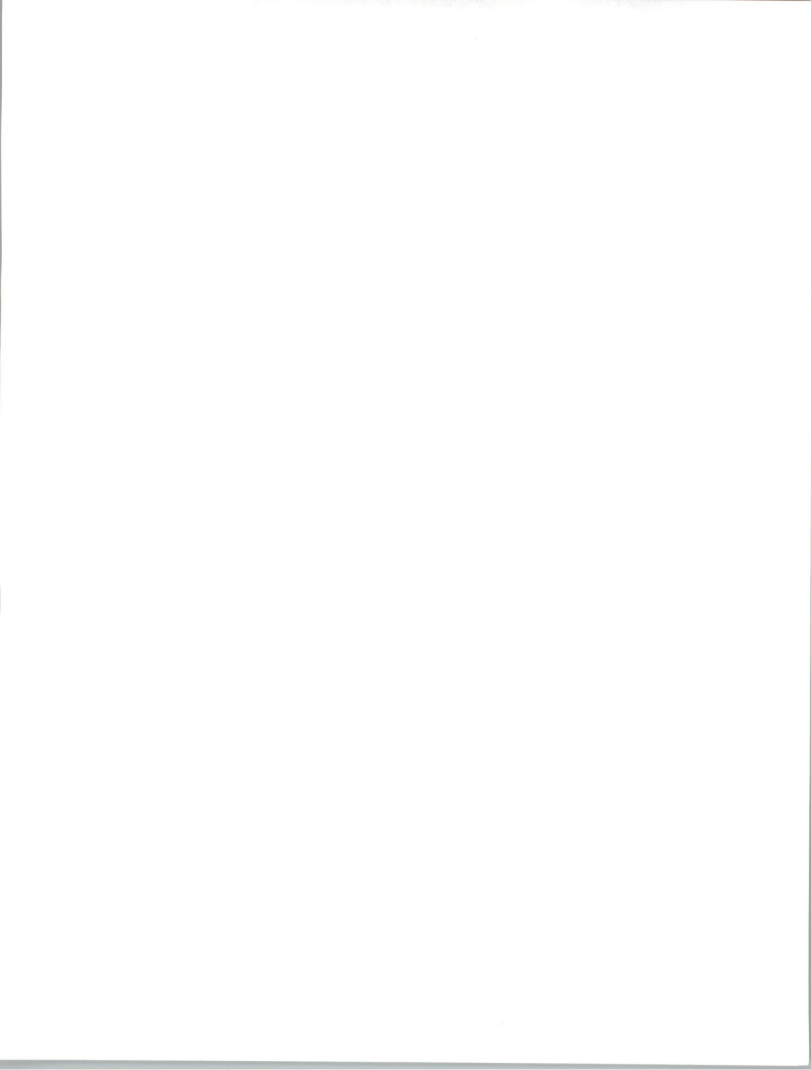
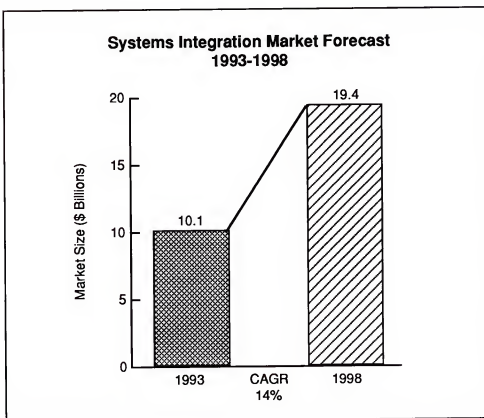


Exhibit IV-2



The growth of SI expenditures will be uneven however.

- CAGRs forecast for utilities, insurance, state/local government and the federal government are approximately 2% below the previous forecast as indicated in Exhibit IV-3.
- Five-year CAGRs for discrete manufacturing, transportation, retail distribution and business services are within 1% of the previous forecasts.
- Increases in CAGRs over the previous five-year forecast are estimated for process manufacturing, telecommunications and health services.

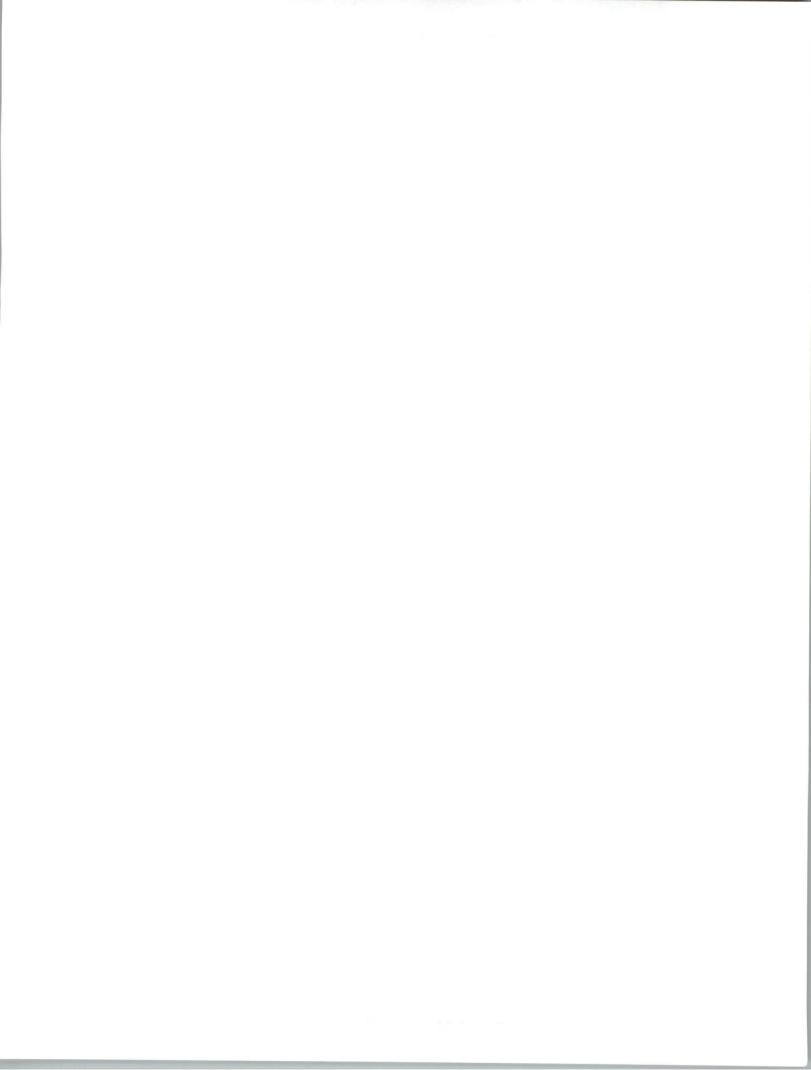


Exhibit IV-3

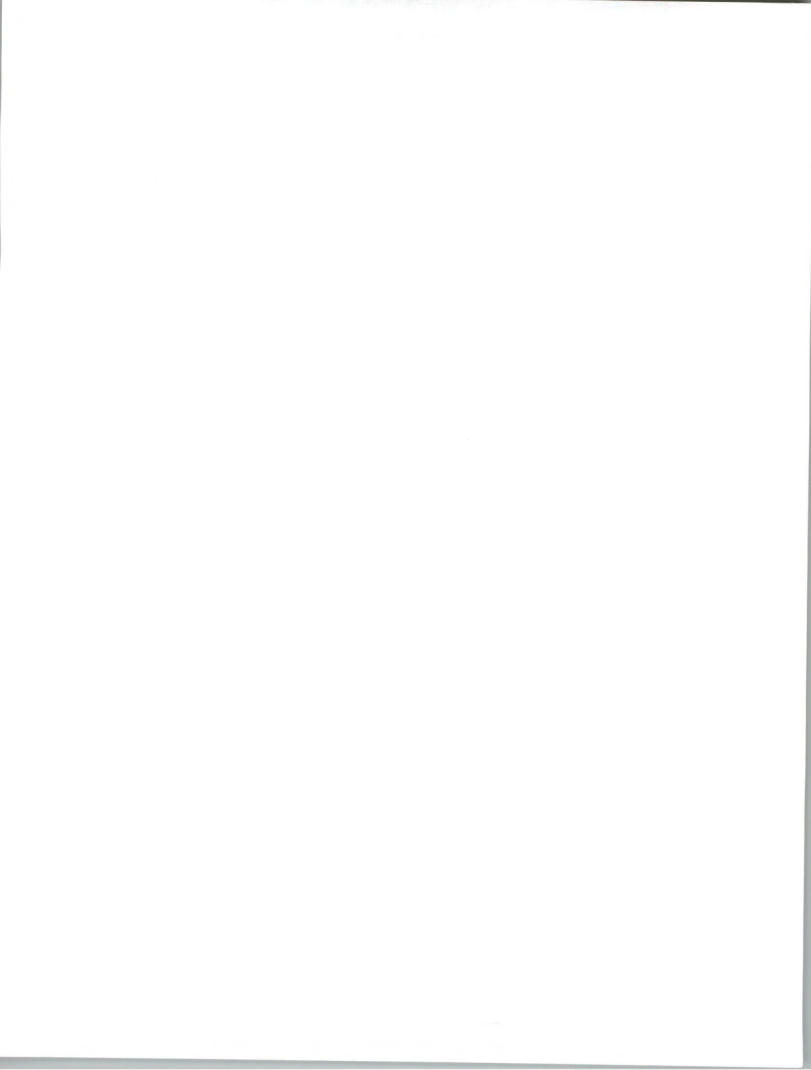
Change in Five-Year CAGR

Vertical Market	1992-1997	versus	1993-1998
Discrete Manufacturing	21		20
Process Manufacturing	14		15
Transportation	20		19
Utilities	12		10
Telecommunications	21		22
Retail Distribution	21		20
Wholesale Distribution	16		16
Banking/Finance	21		21
Insurance	19		17
Health Services	11		18
Education	17		17
Business Services	24		23
Federal Government	12		7
State and Local Government	21		12
Miscellaneous	N.A.		16

Growth rates are high in a number of vertical markets including discrete manufacturing, telecommunications, retail distribution and business services where they are at least 20%. The CAGR for the full market suffered from the drop in federal government SI expenditures.

C**Driving Forces and Inhibiting Factors****1. Driving Forces**

SI projects are reported to be classic business goals for the following reasons.



- Increasing revenue and productivity or providing better service still leads in SI activities benefits.
- Supporting the re-engineering of processes or limited restructuring of organizations is also important in justifying projects. System changes to support the reduction of personnel through downsizing programs are of high importance, as well.
- Projects are also driven by the need to fix or upgrade existing technology or business systems. These actions can provide savings over a period of time if not immediately, and they can also guard against problems that might occur in future expansion or replacement of IT facilities.

2. Inhibiting Factors

There are definite factors that have inhibited the use of SI.

- Uncertainty in business planning is a key inhibitor having more of an impact than budget limitations.
- The uncertainty may be related to the discontinuation or sale of product lines or other major business changes. Corporate acquisitions and mergers may also be reasons to suspend consideration of SI.

Short-term pressures for system changes to overcome problems affecting business or handling changes in business, can cause delays in considering the use of an SI vendor to handle major new projects.

- A series of changes may delay SI projects for lengthy periods, according to some respondents. In some cases, an IS manager may argue that the ability to produce immediate improvements and payoffs in business can be delayed by the initiation of large-scale SI projects.
- Several SI vendors noted they try to include near term changes to address current problems into SI projects in order to overcome this situation.



The leading trend, recognized by users in relation to SI, is an increasing use of this product/service market. The increase may include projects where an internal group is in charge of, or shares direction of, SI projects.

The increase in SI use has been accompanied with increased contact from firms promoting their SI capabilities (chiefly professional services or consulting vendors). These firms are concerned with both gaining SI contracts and not being excluded from consideration for large jobs.

D

Vendor Competition

1. Analysis of Competition

Competition has been rapidly increasing for potential SI work. One Fortune 100 company reported that presentations on the use of SI had been recently offered not only by its IT hardware vendors, but also by several large professional services firms, its two auditing firms, strategic consultants and three major SI vendors.

One reason for this increase in competition is the differential in rates between SI and professional services business.

- SI contracts involve commitments to achieve a solution, priced and paid for at a higher rate than supplying capabilities to work on a time-based or task-based assignment as professional services firms do.
- Professional services vendors also compete against numerous temporary services firms, one person or small vendors offering professional services capabilities at very low prices. These vendors have increased greatly in number due to corporate personnel reductions and supplies of foreign programmers.



There is more guarantee of obtaining a substantial amount of continuing work, as well as higher pricing, with SI contracts than with professional services work. Professional services contracts are also more likely to shrink or be subject to reconsideration if business changes or new IT technology is considered.

SI can also provide the opportunity to preclude competition in some situations. If an SI vendor becomes involved in consulting work involving re-engineering or other consulting, there is a good possibility the resulting projects will use the SI vendor.

- In the past, a corporation would often use one vendor as a consultant and select another vendor to implement the systems recommended. In a re-engineering situation, the knowledge the vendor has acquired can be quite valuable in implementation work.
- At the present time, corporations are interested in finding vendors they can rely on to aid with business and technological change. When a vendor can point to in-depth experience with change and has relevant technical and business knowledge, there is less likelihood that assignments will be split between vendors.

In addition to the above, large professional services firms have been trying to compete for SI business since vendors, known for their SI business, have a higher valuation in the marketplace. Mergers, acquisitions and fund raising, as well as sales of holdings, can all benefit from this valuation.

2. Market Shares

Estimates of market shares of the total U.S. SI market for 1992 are indicated in Exhibit IV-4 for the leading vendors.

- The most striking change from the 1991 market is that seven of the vendors listed have increased their market share which includes the top six vendors.



- To maintain a leading position among SI vendors, competitors must be constantly striving to gain market share.

Exhibit IV-4

U.S. Systems Integration Market Share, 1992

Vendor	Share (Percent)
IBM	19
Andersen Consulting	10
EDS/GM	9
Digital	8
Unisys	8
CSC	6
SAIC	5
Martin Marietta	4
TRW	4
PRC	3

Actually, the leading SI vendors would rather maintain a high rate of growth more than gain market share from other competitors. In order to accomplish this, these vendors are moving into new market niches as well as offering new services that will lead to the use of SI, such as consulting in relation to BPR.

In order to maintain a high growth rate, SI vendors will have to devote more attention to the commercial market because the growth rate in the federal market is forecast to fall to 7% for the period from 1993 to 1998. Most vendors serving the federal market have the same shares of the federal market they had in 1991.

- Exhibit IV-5 summarizes the shares of the federal market..
- Only SAIC, a specialized vendor, shows an increase in market share.



Exhibit IV-5

U.S. Federal Systems Integration Market Share, 1992

Vendor	Share (Percent)
IBM	16
SAIC	10
EDS	8
Martin Marietta	8
CSC	7
Unisys	7
Hughes	5
Boeing Computer Services	4
Planning Research Corp.	4
Grumman	3

E**Recommendations**

SI firms are continually exposed to ongoing risks in their activities. Not only are they exposed to losses of revenue and possible law suits if projects are not successful, they are also under pressure to constantly upgrade and improve their solutions to complex problems as EDS and Unisys have done in banking and CSC has done in manufacturing.

- SI vendors must maintain awareness of new IT developments and techniques that could offer improved solutions in the market areas in which they specialize. Competitors could make use of new developments to enter their markets if vendors delay.
- Leading SI vendors must also constantly look for new business approaches or technology that will enable them to enter new markets or expand their penetration of existing markets (as Andersen Consulting has done in developing capabilities in imaging systems to further penetrate the airline and pharmaceutical industries).



The desire to maintain a rapid rate of growth, together with high margins, makes it necessary to consider introducing additional services or plunging into new market niches. Some new directions could prove to be costly mistakes, however.

- Application approaches, including software products developed for a company in a new market niche, might not be suitable to other companies in this niche. Some SI vendors rely too greatly on their own ideas about markets.
- The desire to make new services and upgraded application solutions available as rapidly as possible, exposes SI vendors to a high level of risk with important clients. It is not surprising that a number of SI vendors are taking steps to control and improve quality.

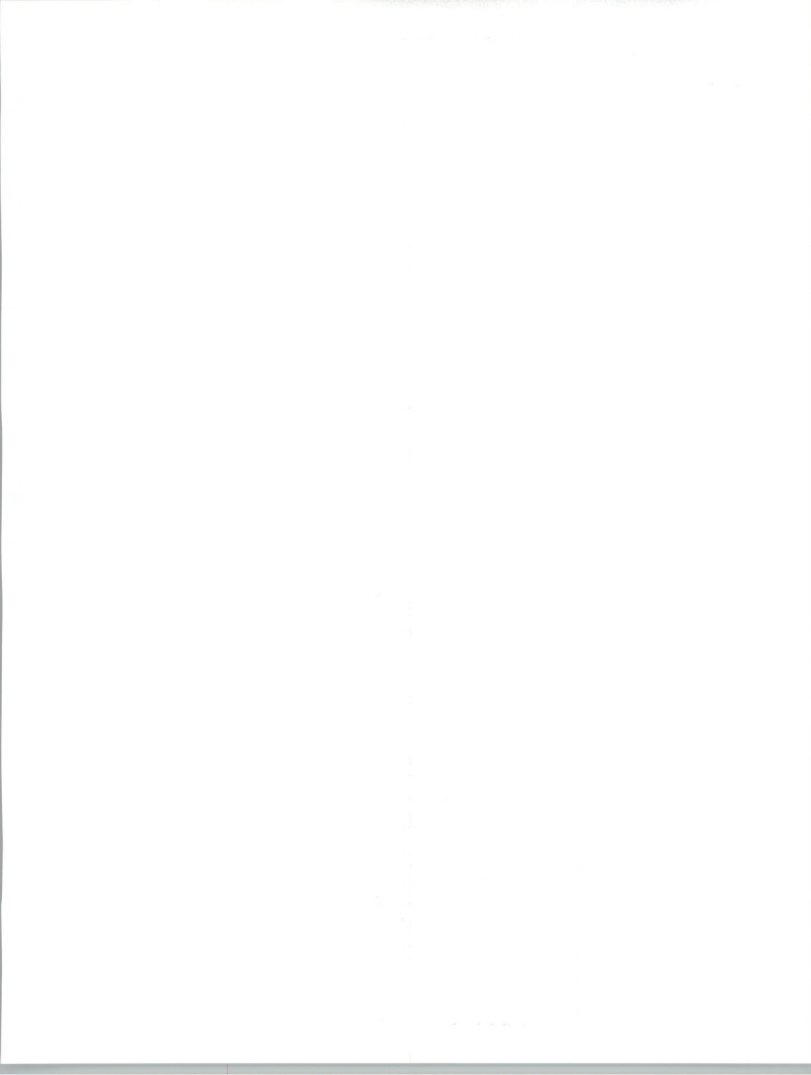
Constant research should be carried out in a number of areas as suggested by Exhibit IV-6.

- Vendors must have ongoing programs or research for analyzing new technology to determine if it offers opportunities to improve application systems in target vertical markets.
- Vendors must also stay aware of competitor activities in their target markets to find out what IT improvements or new functional capabilities are being offered.

Exhibit IV-6

Recommendations

- Research on new technology and application solutions must be more formerly planned
- Ongoing research is needed on market needs before commitments are made
- There should be inventories made of technical skills
- Sources of additional skills should be investigated
- Ongoing research is necessary to improve development quality as well as speed



SI vendors must also constantly evaluate market areas to determine which ones offer most opportunities in relation to future planning. The development of a new application solution should be preceded or at least accompanied with research on the relative importance of needs in the market area of interest.

SI vendors must also have plans to train or acquire the technical talents necessary to support their plans.

- Clients expect an SI vendor to be prepared to address technical needs on an immediate basis.
- Firms that supply temporary personnel with limited technical skills, report they have had emergency requests from SI firms that find they are unable to meet the requests of clients or their own schedules for projects because of the under skilled personnel.

SI vendors must also engage in research on methodology along with tools and development techniques that can improve productivity and quality for application development.

- This can raise the level of development within the SI firm and make it possible to deliver better products more rapidly.
- It can also provide an opportunity to market capabilities for application development to clients.

One subject an SI firm should consider offering is training and consulting assistance for client/server systems. These systems are growing without overall plans in many companies, and aid is being sought.

- There is a market for education and consulting on the review of potential problems that can result from the use of client/server technology as well as the opportunities it offers.
- Training and consulting aid for this technology may also provide a vendor with information on user plans that would aid in identifying opportunities.





Outsourcing Market Analysis

A

Information Systems Outsourcing

INPUT defines outsourcing as the *contracting of all or a major part of an information systems process to an external vendor on a long-term basis*. The vendor takes responsibility for the performance of the process. Outsourcing is a method of acquiring a vendor to provide for existing operations, not a product/service market. Within this framework, systems operations in its two forms and platform and applications operations, represent the major portion of the outsourcing market. Both can include a variety of elements, as illustrated in Exhibit V-1. The client that chooses to procure only one of the elements is still outsourcing to a vendor.

It is increasingly important to understand each component of the outsourcing market. This identifies how the market is shifting as client needs change and what implications that has for the vendors.

1. Platform and Applications Operations

The two systems operations subsectors continue to be the dominant segments of the outsourcing market. Most clients still want the vendor to take over management of the data center, or the data center with its associated applications software. The two components together make up 78% of the current contract revenues.



This phenomenon reflects two market conditions. First, a large number of the contracts entered into several years ago are still in effect. The majority of those were for platform operations or applications operations. Second, most of the so-called megacontracts that have emerged in the last few years are of the systems operations type. The mere size of these individually has a definite effect on the overall size of the market for platform and/or applications operations.

There is a change even in the systems operations segment of the market, however. Many of the new systems operations contracts are considered transition outsourcing contracts. The vendor takes over management of the legacy systems while the client turns its energies and resources to designing and implementing a new, re-engineered environment, usually involving client/server platforms. These contracts, by their transitory nature, are often of shorter duration than earlier systems operations contracts. So the impact of the shift to client/server is being felt in this segment of the market also.

2. Desktop Services

The desktop services segment of the market will continue to grow at a rate above 20% over the five-year period from 1993 to 1998. This reflects the recognition by clients that it is more difficult to manage a distributed computing environment than a centralized one.

More organizations are outsourcing the management of their PC/workstation inventory to vendors who deal with the problems of standardization, compatibility and security. The LANs associated with this equipment are also generally included in the arrangement with the vendor.

The typical pattern reported in a desktop services environment is for a net increase in total operating costs to occur at the start, with substantial savings occurring in the out-years of the contract for the user organization. EDS has reported this pattern as typical of its experience with clients. EDS attributes it primarily to a gradual centralization of many of the diverse functions involved, such as help desk support and equipment maintenance. This eventually provides substantial cost leverage to the service supplier, which is passed on as savings for the client.

3. Network Management

There is a healthy increase in the growth rate of the network management segment of the market over the rate reported last year (20% to 26%). The size of the market is expected to more than triple in the next five years.

The network management component includes only those contracts where the network alone is outsourced. When the network is outsourced as part of the platform or applications operations agreement, that network component is counted in those contracts.

There have been several examples of such contracts this year, notably NASDAQ to MCI, Republic Bank to EDS and Metropolitan Life to AT&T. In two of these cases, it marks the entry of the telecommunications companies into the outsourcing market. In early November, AT&T announced a new organization of 1,000 professionals devoted to participating in the outsourcing market, so there is likely to be increased activity in this subsector soon.

More of these contracts can be expected. This change reflects the increasing importance of the communications network as a means of interconnecting the distributed computing environments that are emerging as a result of the shift to client/server.

4. Business Operations

There is increasing demand for outsourcing vendors to take over entire business functions for clients. Though not a new market (print shops have been outsourced for some time now), the existing arrangements are evolving into more comprehensive document management contracts. Other parts of the outsourcing market are also evolving into this form of outsourcing arrangement.

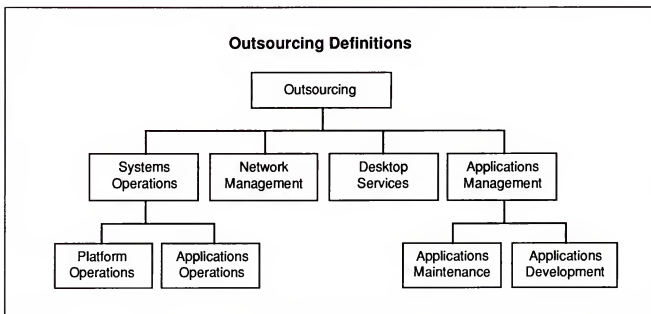
The claims processing contracts that have been part of the market for some time now, no longer only include the processing of claims. Now, the client usually turns over responsibility for issuing of checks and handling of complaints and claimant questions to vendor personnel.



Andersen Consulting attracted attention to this market shift two years ago when it assumed management of the accounting function at BP Exploration in the U.K. There is some activity among the large accounting firms to take over financial functions for some of their clients, though no contracts have yet been announced .

EDS has assumed operational responsibility for customer services operations in three situations, one of them with the Chevrolet Motors Division of GM. In these cases, EDS can apply technology and best management practices to improvement of the process. The result is lowered costs and reduced need for management attention to the process, as well as improved customer service.

Exhibit V-1





B**Market Size and Forecast, 1993-1998**

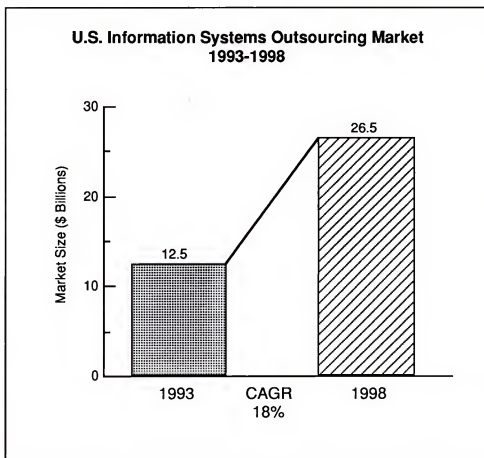
Early press reports in 1993 saying the outsourcing market was slowing down, were greatly exaggerated. INPUT's continuing analysis of the market indicates that the healthy growth rate is indeed continuing. There is a high probability that some very large contracts currently being negotiated will be closed before the end of 1993. All indications are that the market is healthy, though significant changes are still taking place.

Exhibit V-2 illustrates what will happen to the outsourcing market in the period from 1993 to 1998. The compound annual growth rate (CAGR) of 16% still makes outsourcing one of the fastest growing segments of the information services market. The market is currently projected to be at \$12.5 billion for 1993. That market will more than double to \$26.5 billion in 1998. This represents a CAGR of 16% for the forecast period.

Though the overall market growth has slowed somewhat from last year's rate (from 18% to 16%), certain components of the market are showing a high degree of growth over the five-year forecast period. The components showing this increased growth are those most impacted by the shift to client/server platforms. These are the network management and the desktop services components. They will be discussed at some length in Section C below.



Exhibit V-2



C

Types of Outsourcing Arrangements

Each subsector of the market will be discussed in this section. It is increasingly important to understand each component of the outsourcing market. This section identifies how the market is shifting as client needs change and the implications of this for vendors.



1. Platform and Applications Operations

The two systems operations subsectors continue to be the dominant segments of the outsourcing market. Most clients still want the vendor to take over management of the data center, or the data center with its associated applications software. The two components together account for 78% of current contract revenues.

This dominant proportion reflects two market conditions. First, a large number of the contracts entered into several years ago are still in effect. The majority of those were for platform operations or applications operations. Second, most of the so-called megacontracts that have emerged in the last few years are of the systems operations type. The sheer size of these, individually, has a definite effect on the overall size of the market for platform and/or applications operations.

Platform operations will grow at a 12% CAGR over the forecast period. This rate, lower than the overall market rate, represents a shift to more applications operations arrangements, as well as some shorter term, lower-value transition contracts. The market for platform operations will go from \$4.1 billion to \$7.1 billion over the forecast period.

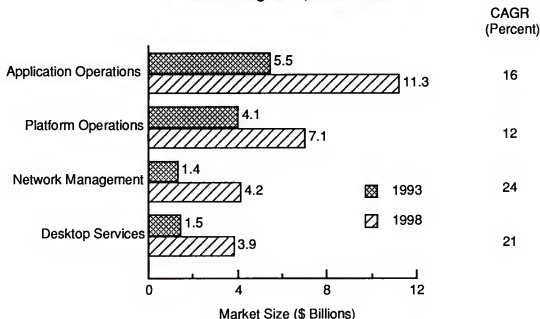
Applications operations will grow at the higher rate of 16% CAGR. Clients are becoming more willing to turn over data center and applications management to the vendor. They are particularly prone to turn over legacy systems that are slated to be phased out eventually. The market for applications operations will grow from \$5.5 billion to \$11.3 billion over the forecast period.

Exhibit V-3 illustrates how each subsector of the overall outsourcing market compares in size to the other subsectors. The two systems operations subsectors are obviously the largest part of the market.



Exhibit V-3

U.S. IS Outsourcing Market Forecast by Market Segment, 1993-1998



There is change even in the systems operations segment of the market. Many of the new systems operations contracts are considered transitional. The vendor takes over management of the legacy systems while the client turns its energies and resources to designing and implementing a new, re-engineered environment, usually involving client/server platforms. These contracts are often of shorter duration than earlier systems operations contracts. So the impact of the shift to client/server is being felt in this segment of the market also.

There are indications that some legacy systems that are not frequently run, will stay on the old platforms. These are natural candidates for smaller applications operations arrangements. The client has no need for the hardware in order to process them. Rather, the client will look for a vendor to simply provide



an environment in which these applications can be run. The vendor will assume responsibility for maintaining the software to reflect changing operating conditions and running them, by request, on a facility owned and operated by the vendor.

2. Desktop Services

The desktop services segment of the market continues to grow at a rate above 20% during the five-year period from 1993 to 1998. This reflects the recognition in the market that it is more difficult to manage a distributed computing environment than a centralized one. The market will grow from \$1.5 billion to \$3.9 billion over the five-year forecast period.

More organizations are outsourcing the management of their PC/workstation inventory to vendors to deal with the problems of standardization, compatibility and security. The LANs associated with this equipment are also generally included in the arrangement with the vendor.

To better understand the elements of desktop services, the following components have been identified by vendors as services they offer in this segment:

Purchasing Consultation - Advice and direction in the selection and configuration of equipment for a specific client need.

Equipment Supply - Assembly and delivery of equipment to meet the desired specifications defined either by the client or jointly with the vendor.

Software Supply - Delivery of the appropriate software to be installed on existing equipment. Compatibility and version control are critical here.

Equipment Maintenance - Diagnosis and repair of equipment problems and provision of preventive maintenance on a regular schedule if appropriate.



Installation Services - Upon delivery—connecting, loading and starting of the user's software to test the system's response. Also known as the "burn-in" activity, though this is sometimes done remotely before the equipment/software combination is delivered.

LAN Management - Regular maintenance of the local-area network (LAN), including backup and adding users to the system, as well as resolving operational problems.

Help Desk / User Services - Responding to user questions about software and equipment problems and resolving them via phone access.

User Training - Includes providing courses on-site to user groups for hardware operation and software use. Training can take the form of classroom instruction, CA tutorials tailored to client needs, or other forms.

Logistics Management - Managing the acquisition of equipment components and software according to predetermined specifications and the delivery of these to the appropriate client locations in a form suitable for installation.

Network Interface Management - Providing the expertise to interconnect various LANs in the organization to one another or to WANs, public access networks and common carriers. Dealing with these other providers and arranging for any interface software or hardware.

Not all of these elements have to be present in every desktop services arrangement. At a minimum, however, the vendor should be responsible for the PC/workstation inventory and some components of the help desk support function, as well as the maintenance activity.

The typical pattern reported in a desktop services environment is for a net increase in total operating costs to occur at the start, with substantial savings occurring in the out-years of the contract for the user organization. EDS has reported this pattern in its experience with clients. It attributes it primarily to a



gradual centralization of many of the diverse functions involved, such as help desk support and equipment maintenance. This eventually provides substantial cost leverage to the service supplier, which is passed on as savings for the client.

3. Network Management

There is a healthy increase in the growth rate of the network management segment of the market over the rate reported last year (20%, now raised to 26%). The size of the market is expected to more than triple in the next five years, going from \$1.4 billion to \$4.2 billion.

The network management component includes only contracts where the network alone is outsourced. When the network is outsourced as part of a platform or applications operations agreement, that network component is counted in those contracts.

There have been several examples of such contracts this year, notably NASDAQ to MCI, Republic Bank to EDS and Metropolitan Life to AT&T. In two of these cases, it marks the entry of the telecommunications companies into the outsourcing market. In early November, AT&T announced a new organization of 1,000 professionals devoted to participating in the outsourcing market, so there is likely to be increased activity in this subsector soon.

More of these contracts can be expected. This change reflects the increasing importance of the communications network as a means of interconnecting the distributed computing environments that are emerging as a result of the shift to client/server.

4. Business Operations

There is increasing demand for outsourcing vendors to take over entire business functions for clients. Though this is not a new market (print shops have been outsourced for some time now), the existing arrangements are evolving into more comprehensive document management contracts. Some other parts of the outsourcing market are also evolving into this form of outsourcing arrangement.



This subsector of the outsourcing market will be forecast separately this year, so is not included in the tables in the Appendix. It will appear as a component of the larger market next year.

The market size for this subsector consists of newly identified activity as well as existing revenue from current applications operations contracts that have evolved into business operations outsourcing. It is expected that INPUT will be able to isolate this component of the market after further research next year. It was projected to be at \$500 million in 1993 and will grow to \$1.7 billion by 1998, at a CAGR of 28%.

The claims processing contracts that have been a major part of the outsourcing market for some time now no longer only include the processing of claims. Now the client usually turns over responsibility for issuing checks and handling complaints and claimant questions to vendor personnel, also.

Andersen Consulting attracted attention to this market shift two years ago when it assumed management of the accounting function at BP Exploration in the U.K. There is activity among large accounting firms to take over financial functions for some of their clients, though no contracts have been announced yet.

EDS has assumed operational responsibility for customer services operations in three situations, one of them with the Chevrolet Motors Division of GM. In these cases, EDS can apply technology and best management practices to improvement of the process. The result is lowered costs and reduced need for management attention to the process, as well as improved customer service.

D

Vendor Competition, 1992

Exhibit V-4 identifies the changes that have taken place in the market between 1989 and 1992. EDS had the market leadership position then and still does now. It has expanded the breadth of services it offers from traditional facilities management to desktop services, and is positioning itself to move aggressively into business operations outsourcing.

10

CSC remains in the second spot, but its revenue mix has changed considerably. In 1989, it derived most of its outsourcing revenues from the federal market. In 1992, after a concerted effort and several major wins, particularly the large General Dynamics contract, it had a better balance between federal and commercial contracts.

Exhibit V-4

Leading Outsourcing Vendors, 1989-1992

1989	Percent Share	1992	Percent Share
EDS	16	EDS	14
CSC	5	CSC	5
Systematics	3	ISSC	4
ACS	3	First Data	3
Shared Medical	2	Digital	2

The rest of the top vendors have been changing in the three-year period. Although ISSC did not even show in the list in 1989, that was partly because ISSC had not been organized into a separate unit and some of the IBM revenue that was really outsourcing was not identified as such. ISSC has aggressively attacked the market, however, and is growing its revenue base substantially each year.

First Data Resources has grown into the top vendor ranks because it has capitalized on its own strong position in the financial community and coupled that with substantial growth of its health care business, acquired from Lockheed several years ago.

Digital has shown substantial growth in the services portion of its business, much of it in the outsourcing area, particularly in the network management and desktop services segments.

Unisys has aggressively pursued outsourcing opportunities and will probably move up into the top five next year.



E**Conclusions**

This report examines the forces at work in the outsourcing market. The continued health of that segment of the information services market is due, in part, to the continued aggressive marketing of the concept by the vendors. It also reflects the increasing complexity of the IT environment as client/server architectures begin to dominate and the benefits of expanded communications options continue to increase.

1. Conclusions

The outsourcing market continues to show health by growing at a faster rate than most of the other segments of the information services market. The continued slow recovery of the economy and the massive downsizing that has been experienced in the commercial arena is now affecting the public sector also. The option of turning over IS functions to a vendor is becoming more attractive as IS staffs shrink and IS expenditures are scrutinized even more closely. Exhibit V-5 presents the key conclusions for the outsourcing market.

Exhibit V-5

Outsourcing Market—Conclusions

- Strong market growth continues
- Client/server shift impacting market
- New vendor/client relationships emerging

There are more and more success stories to encourage senior management to consider this alternative. INPUT research indicates that outsourcing clients are relatively satisfied with the performance of the vendors with whom they have contracts.



The traditional sectors of systems operations—platform and applications operations—will experience a slowdown in their growth rate. Other types of outsourcing, notably desktop services and network management, will experience a substantial increase in their rate of growth.

Desktop services deals directly with the immediate problem of managing the burgeoning inventory of PCs and workstations and their associated LANs and WANs that result from the shift to dispersed processing. The vendors must deal with issues of compatibility as well as providing management of standards, providing for system security and trouble-shooting connectivity problems in the networks. Most of these arrangements eventually include the management of the help desk functions for the client also.

The network configuration needed to support this dispersed computing—connecting the LANs to gateways and providing for higher capacity T1s and common carrier network management—is a challenge also. Vendors are increasingly considered the repository for tools and expertise to provide this service in a much more effective manner than individual IS organizations can. For this reason, traditional outsourcing vendors such as EDS, Digital and ISSC (through Advantis) are providing this service, while the common carriers are also entering this market.

Downsizing and the need for improved financial performance that commercial organizations are experiencing have had another effect on the outsourcing market. Clients are demanding a closer relationship between the management of their IS resources by the vendor and the impact on the firm's financial performance.

In a number of public forums, conferences and press statements, outsourcing prospects and clients alike are asking vendors to share in the risk of the client's business. They are asking that vendors share with the clients the benefits of the cost reductions that occur. They are suggesting that vendors be compensated on the basis of the success of the client organization's business, not on the basis of the work performed.



As of yet, many vendors are reluctant to do this. There are several reasons for this. It is obviously difficult to agree on the metrics that would be used to measure success in this environment. There are also difficulties in assigning responsibility for business performance in this scenario.

2. Recommendations

The changing market conditions require changes in strategy on the part of the outsourcing vendors. These changes must reflect the new demands placed on the vendors by the business community. They must also reflect the changes in technology that are shaping the new market environment. Exhibit V-6 presents the foremost telecommunications in the outsourcing market.

Exhibit V-6

Outsourcing Market—Recommendations

- Broaden service offerings
- Demonstrate value of arrangement
- Expand relationship with clients

Many of the outsourcing vendors in the market are currently seeking to increase the scope of the services they offer to their clients and prospects. Some of the firms are already large and are simply assimilating some of the service components of their kindred organizations. IBM's recent consolidation of most of the company's service functions under Denny Welsh at ISSC is the most recent example of this. Digital's earlier Services Group reorganization is a similar strategy.

Other vendors are acquiring assets in the marketplace to supplement their own resources. CSC did this over the last three years, and SHL Systemhouse has been aggressively acquiring client/server assets this year. Still others are forming strategic alliances that make sense. Unisys, teaming with Systematics, and May and Speh, teaming with Ameritech, are two examples that come to mind.



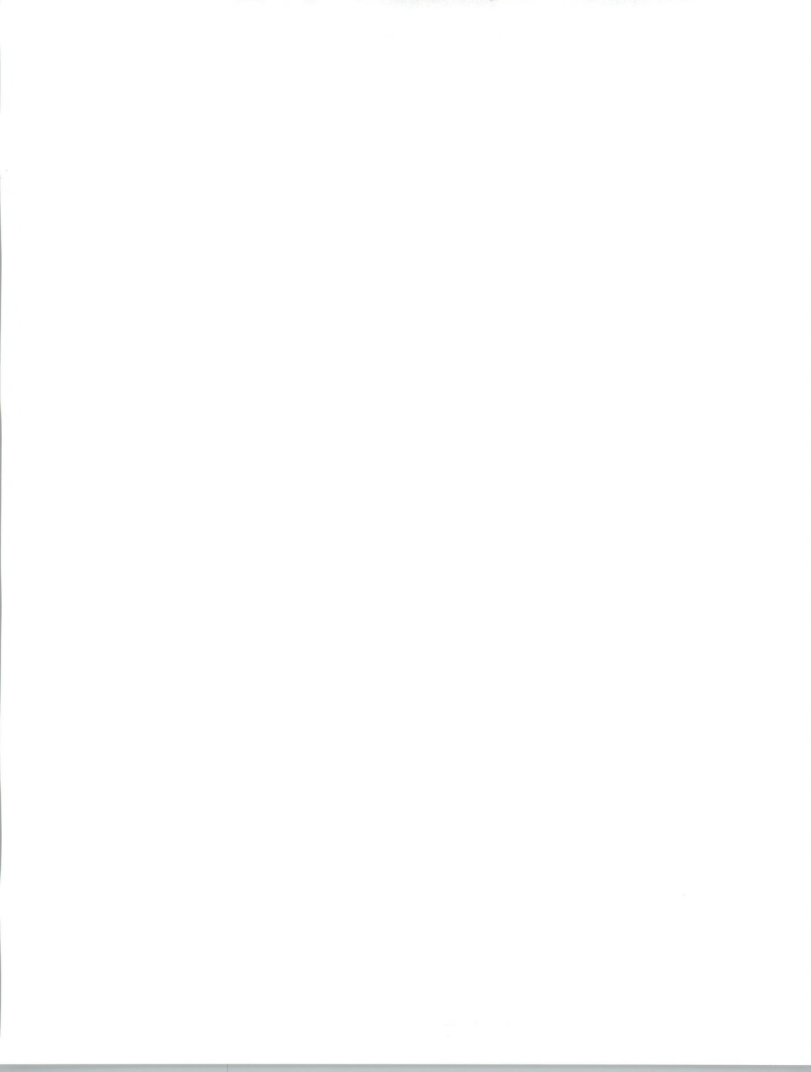
Outsourcing vendors will need to become systems integrators. They will need to expand their telecommunications capabilities. They will have to decide if they want to manage applications software also. All of these options lead to an expanded market presence, one that the successful vendor will need to develop.

Vendors are being asked to demonstrate the value they bring to the outsourcing relationship more frequently. Clients are asking questions about how the relationship can improve their competitive position. They are asking how it can provide better service to the clients' customers. Outsourcing vendors need to respond with value-based assessments of their services, based on all the factors that make up a successful outsourcing arrangement.

More of these creative approaches—part marketing approach, part hard-nosed financial analysis and measurement—must be developed by the vendors who want to distinguish themselves from the other market players.

Another way to provide more value is to strengthen the relationship with the client. The prime example of this type of arrangement is the relationship Acxiom has with its largest outsourcing client, TransUnion. The president of TransUnion joined the board of directors of Acxiom shortly after the contract was signed. Now the client's chief executive has a direct hand in strategy review for the vendor and is also intimately aware of the vendor's ongoing financial condition.

Not all client/vendor relationships need to be this close. The reality is that the direct involvement of the vendor in supporting the day-to-day business of the client through the IS function normally makes this relationship evolve into a closer one. By finding ways to enhance communications between the two parties, vendors can assure that client satisfaction is raised, and the chances for a long-term relationship are greatly improved.



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Processing Services Market Analysis

A

User Issues

There are a number of general business or technological issues and trends occurring in the U.S. today that are affecting the need for processing services. These factors are likely to affect demand positively in some ways and negatively in other ways. These include:

Economy - Clearly the state of the economy affects the demand for any kind of product and service. Yet processing services, being usage-based by nature, are particularly vulnerable. Such revenues are based on day-to-day usage, and as usage goes down due to economic factors, revenue follows. For example, unemployment has a direct effect on volumes for payroll services, as fees are typically on a "per employee" basis. Credit/debit card processing is based on purchasing volumes. As buyers tighten their belts and buy less, the volume of transactions goes down. On the other hand, use of credit can also go up as buyers defer payment to a later time.

The economy has led many companies to rethink their strategies and reorganize and streamline their businesses. This has led to cutbacks across the board—particularly in the information systems area. Such reasoning has made it less feasible for companies to consider moving applications in-house and, in fact, has led some companies to move in-house systems to a third-party provider.



In the state and local government sector, reduction in federal funds has forced users to look to the outside for help. State and local government allocations for IS funding are frequently affected by legislative decisions to deliver new or different services; to raise or lower taxes on sales, incomes, or property; or otherwise change the way business is conducted. These all impact the development and operation of information systems.

Health Care Reform - The way that health care is provided in this country is about to undergo dramatic changes. It is expected that the managed care approach will prevail, with strong emphasis on containing or reducing costs. While more people will be covered, there may be services that are typically available with most health care plans today that will be not be covered in the future. Processing services to the health care and insurance industries will be affected by all these changes. More information will need to be tracked and reported. Analysis will be required to control costs and claims processing will become more complex.

These changes all provide opportunities to the processing services vendor. As health care providers and insurers struggle to contain costs, investments in additional systems to support processes (that have become more complex) may be difficult. The availability of services through a third party that understands those needs and can address them cost effectively could be attractive to these businesses.

Specialized needs - The proliferation of PCs and LANs in businesses has led to the automation of an increasing number of functions. Many of these are unique to the industries involved. For example, in the health care industry, patient records are now being computerized and integrated with administrative and financial systems. With the budget cutbacks that many companies are experiencing and the lack of skilled personnel to support new systems development, the availability of third-party solutions presents an attractive option.

Many vendors have recognized needs in specific niches and have developed solutions specifically for these industry requirements. Flexibility is a key advantage, with solutions being available either through the vendor as the processing service or as soft-



ware if the buyer chooses an in-house option. There are companies, particularly in the health care environment, that have chosen to provide specific services to address the needs of this market. In the billing arena, vendors have chosen to specialize on cable TV billing only, targeting that specific niche. Buyers are confident in using a third party that understands the specifics of their business and recognizes the economies of scale and capabilities that such a third party can offer.

Outsourcing Trend - There is a definite trend toward outsourcing some or all of information processing in many industries today. This trend is changing the mindset of buyers. As they see their budgets shrink and other companies move to outsourcing, the desire to maintain complete in-house control over systems has lessened. While outsourcing involves a different type of contractual arrangement than use of processing services, the increased reliance on third parties is a positive trend. Many of the traditional transaction processing companies are growing their businesses through the availability of outsourcing.

B

Driving Forces and Inhibiting Factors

1. Driving Forces

As summarized in Exhibit VI-1, the following are the forces driving the use of processing services:

Exhibit VI-1

Processing Services Driving Forces

- Health insurance reform
- Disaster recovery service needs
- Credit/debit card usage
- Emphasis on cost reduction
- Networking requirements
- Economies of scale



Health Insurance Reform - The anticipated changes in the U.S. health care system lend themselves to increased automation. There will be more people served with closer tracking of costs and analysis of services and the appropriateness of them. The approval and claims process will become more complex. On-line claims processing will be a significant part of this trend. Overall transactions between various parties will increase, providing opportunities for transaction processing providers.

Need for Disaster Recovery Services - The number of high-profile disasters in recent years is increasing awareness of the need for disaster recovery plans and services. Yet various studies have shown that the use of these systems has not yet caught up with the obvious need for them. The result is that there are many companies that do not yet use these services, even though they are becoming increasingly aware of their importance. The trend toward the use of client/server technology creates an additional demand, as companies implement critical functions under this architecture and need to have disaster recovery plans for this technology as well as for the mainframe. These forces translate into opportunities for increased business for disaster recovery vendors.

Credit / Debit Card Usage - As credit/debit card providers offer incentives for increased use and include new services, usage of these cards is expected to drive increased demand for transaction processing services.

Cost Reduction: Companies are looking for ways to reduce costs, in general, and for information systems, in particular. Many companies are no longer interested in handling their own applications as they see costs increase and availability of staff decrease. If use of a third party is cost-effective, demand is likely to increase for such services.

Networking Among Parties - In looking at the applications where growth is expected, networking among applications users is common. For example, credit and debit transactions involve communication among various retailers, banks and credit card bureaus. Claims processing involves linkages between a variety



of health care providers (hospitals, physicians, labs) and public and private insurers. In these scenarios, the networking capabilities of processing services vendors offer significant advantages over internally developed solutions.

Economies of Scale - Because processing services vendors handle many transactions for many customers, they are able to invest in sophisticated hardware, software and networking to support these needs. While computer hardware has certainly come down in price, the networking and software required to support minimal transaction time may be less affordable to individual clients. Processing services vendors can offer a significant advantage if they provide such sophisticated capability at competitive pricing. For example, third-party billing and payroll processing companies are able to invest in hardware and software that would be less affordable to small, individual companies.

2. Inhibiting Forces

As summarized in Exhibit VI-2, the following are the forces inhibiting the growth of processing services:

Exhibit VI-2

Processing Services Inhibiting Forces

- Lower cost in-house solutions
- Market maturity
- Slow economy

Reduced Costs of In-House Solutions - Small to mid-sized companies that previously relied on processing services as their only option (due to the high cost of mainframes), now have more alternatives available to them. Costs have continually come down for PC-based systems while the power of these systems has increased. Off-the-shelf software has been developed for many new or existing applications, making it cost-effective (in

many cases) to handle such applications internally. Vendors need to emphasize the economies of scale associated with continued use of processing services and remain cost-competitive with in-house alternatives.

Mature market - In general, the market for processing services is a mature one, particularly in the transaction and utility processing segments. Many of the applications best suited to these services have been implemented and users have been making use of them for some time. For example, for payroll services the market is somewhat saturated, with limited opportunity for significant growth—a growth not likely to occur while unemployment remains at record levels. New growth opportunities exist primarily in the disaster recovery segment, with some opportunity for increased usage in specific segments such as debit card and claims processing.

Economy - The extended recession has made buyers wary of investing in new services and in many cases has resulted in reductions in the number of transactions handled.

C

Market Size and Forecast, 1993-1998

Despite the maturity of the processing services market and the decreased cost of in-house solutions, the processing services product/service market as a whole, is holding its own in the marketplace with an 8% CAGR projected for the period 1993-1997. In fact, in comparison with projections in last year's report, processing services is doing better than expected. As indicated in Exhibit VI-3, actual expenditures in 1992 for processing services were \$19.4 billion as compared with the anticipated \$19.1 billion. INPUT has projected expenditures in 1993 at \$20.9 billion, as compared with the \$20.6 billion projected last year. These improvements were driven primarily by higher than anticipated expenditures in the banking/finance and state and local government segments.



Exhibit VI-3

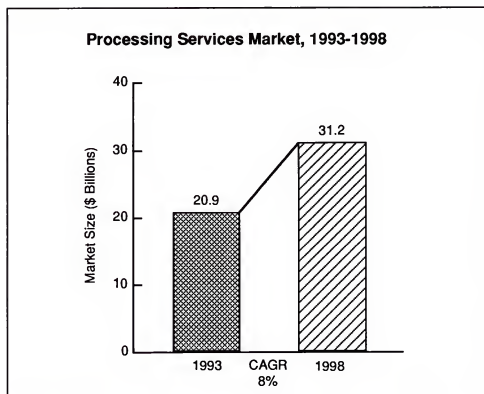
Processing Services Market Overview (\$ Billions)

1992 Report		1993 Report	
1992 Forecast - \$19.1	versus	1992 Actual - \$19.4	
1993 Forecast - \$20.6	versus	1993 Forecast - \$20.9	
1992-1993 Forecast Growth Rate 8% CAGR	versus	1993-1998 Forecast Growth Rate 8% CAGR	

As noted earlier, financial projections in this report address transaction, utility and "other" processing services expenditures. Outsourcing expenditures are provided in a separate report, *Information Systems Outsourcing Market Opportunities, 1993-1998*.

INPUT estimates the processing services market will grow from a 1992 level of \$19.4 billion in expenditures, at an 8% growth rate, to \$20.9 billion in 1993, and projects that it will grow at a CAGR of 8% to \$31.2 billion in 1998, as shown in Exhibit VI-4.

Exhibit VI-4





D

Vendor Competition

The leading vendors, along with their estimated processing services revenues, are listed in Exhibit VI-5.

Exhibit VI-5

**Leading Processing Services Vendors
U.S. Revenue, 1992**

Rank	Vendor	Estimated Processing Services Revenue Shared (\$ Millions)	Growth 91-92 (Percent)
1	ADP	1,368	10
2	FFMC	1,225	36
3	First Data	700	15
4	Ceridian	347	8
5	Fiserv	287	18

It's interesting to note that despite the maturity of the transaction processing segment, which represents the largest portion of processing services expenditures, most of the leading vendors experienced revenue increases in 1992, with many realizing double-digit growth. This can be attributed to a number of factors. Some vendors have grown as a result of aggressive acquisition strategies. For example, in 1993, Fiserv acquired the bank data processing operations of one of its largest competitors, First Financial Management Corporation. Since its inception in 1984, Fiserv has made 40 strategic acquisitions.

In 1992 First Financial Management Corp. acquired a leading health care management services company, a check guarantee and verification services company, and other businesses offering merchant credit card processing. Also, NaBANCO, FFMC's merchant credit card processing subsidiary, further expanded into regional and local markets by opening 24 sales offices across the U.S. And, during 1992, ADP made its largest acquisition when it acquired the payroll services business of Bank of America.



Divesting of nonstrategic businesses has also affected the financial posture of companies in this industry. First Financial Management Corporation sold Georgia Federal Bank, First Family Financial Services, and Basis Information Technologies in 1992.

Other strategies to boost revenue have been to expand into new areas to increase transaction volume. First Data Corporation, a major processor of third-party MasterCard and Visa transactions, entered the oil card and retail card processing business in 1992.

In addition to the large corporations discussed above, there are many transaction processing vendors with significantly lower processing services revenues that each have a very specialized focus in a particular industry or application. These include companies such as Shared Medical, which serves only the health care industry, CableData, which has developed services for the cable television industry, and Anacomp, which is specialized in the micrographics area.

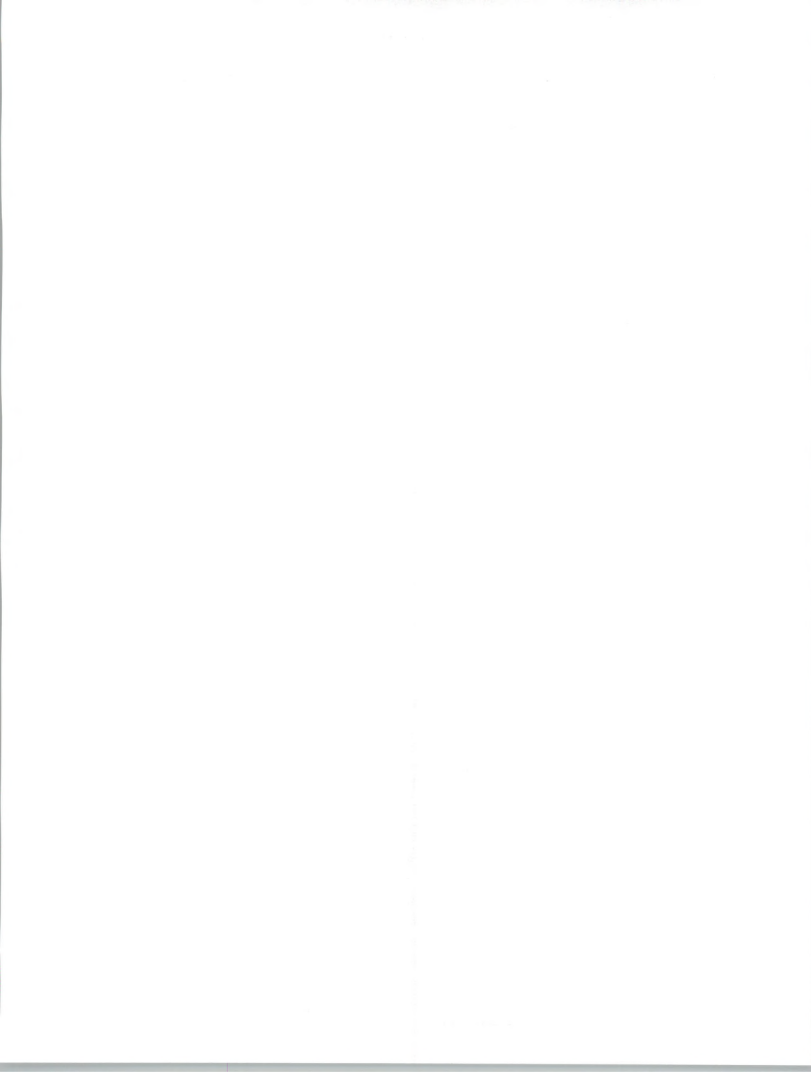
E

Conclusions

INPUT's analysis identifies both positive and negative changes for the processing services market in the next five years. On one hand, there will continue to be significant spending for these services due to the continued demand for traditional services and the expanded use of new services. The economies of scale offered by processing services continue to be an advantage. On the other hand, in some segments of the market, service demand has leveled off and the availability of low-cost, in-house systems is eroding the market. This section discusses INPUT's conclusions as a result of these findings.

1. Expenditures

In looking at the three segments of the market, transaction processing will continue to represent the largest portion of processing services expenditures despite the anticipated growth in the disaster recovery area. Continued growth in this segment is expected through 1998. While some companies may choose to



acquire their own in-house solutions and abandon use of a transaction processing service, INPUT projects that other needs will evolve to fill that void, either through the introduction of new services or increased volumes of existing services. With many companies experiencing reorganization and budget cutbacks, plus the trend toward outsourcing, the use of third-party offerings is looking more attractive. In addition, with the trend toward a global marketplace, processing services vendors offer a flexibility in networking that would be difficult for many companies to justify internally.

2. Demand

The way transaction processing is being used is changing. The demand by small businesses to use a service bureau rather than acquiring a system for traditional accounting procedures has become smaller. Likewise, demand for services such as payroll is leveling off as the unemployment rate continues to creep upward. These uses are being replaced or supplemented by applications where varying volumes and/or complicated networking requirements result in favorable consideration of processing services.

3. Opportunities

To grow their business, transaction processing vendors need to focus on those service areas where a third-party provider can be competitive with other alternatives. For example, in the cable TV billing arena, the whole billing process has become increasingly complex as new forms of service are introduced—including such things as pay-per-view and interactive services. The costs to individual cable companies, many of which are small, to acquire sophisticated billing systems can be prohibitive. The processing services vendor can offer such capability at a considerable cost savings, because usage is shared among many client companies.



Transaction processing vendors can also offer solutions to the unique needs of an industry or to specific application requirements. In the credit/debit card business, the geographic distribution of retail point-of-sale terminals and banks involved in such transactions, and the varying volumes, make a third-party solution with the capacity and flexibility to handle these requirements an attractive alternative.

4. Rate of Growth

While the lion's share of expenditures will continue to occur in transaction services, the largest rate of growth will be for disaster recovery services. Companies today, regardless of their type of business, are reliant on information to function. Many studies have shown that if access to information is lost for any period of time due to computer shutdowns, most companies will no longer be able to survive. Yet at the same time, adoption of disaster recovery plans and services has not yet become widespread—particularly for LANs and distributed computing environments. This is expected to change dramatically over the next few years. The large number of highly publicized natural and manmade disasters in the past few years has increased awareness of system vulnerability. Demand for disaster recovery is expected to be significant as many companies now move to put such contingency plans into place.

F

Recommendations

Based on the conclusions presented, INPUT offers the following recommendations for vendors of processing services.

1. Leverage Advantages

As discussed throughout this report, processing services vendors offer economies of scale for certain applications. Because services are shared among many users, transaction processing vendors can invest in large-scale, sophisticated systems with flexible, high-speed networking capability. Theoretically, because these costs are shared, the cost to the buyer should be reasonable. Vendors need to direct their marketing efforts



toward those application areas where these advantages are most apparent. For example, focusing on the cable billing market offers an opportunity to showcase such benefits. The use of a processing service for basic accounting applications for small businesses that can easily handle such needs on a PC will be a "harder sell" in the future.

In order to emphasize the economies of scale, vendors must make sure that their services do indeed provide such benefits. Vendors should constantly be evaluating new technology that processes information faster and smarter to make sure that their technology is competitive with other alternatives. Because costs are shared, many of those financial benefits should be passed on to the user in the form of competitive costs.

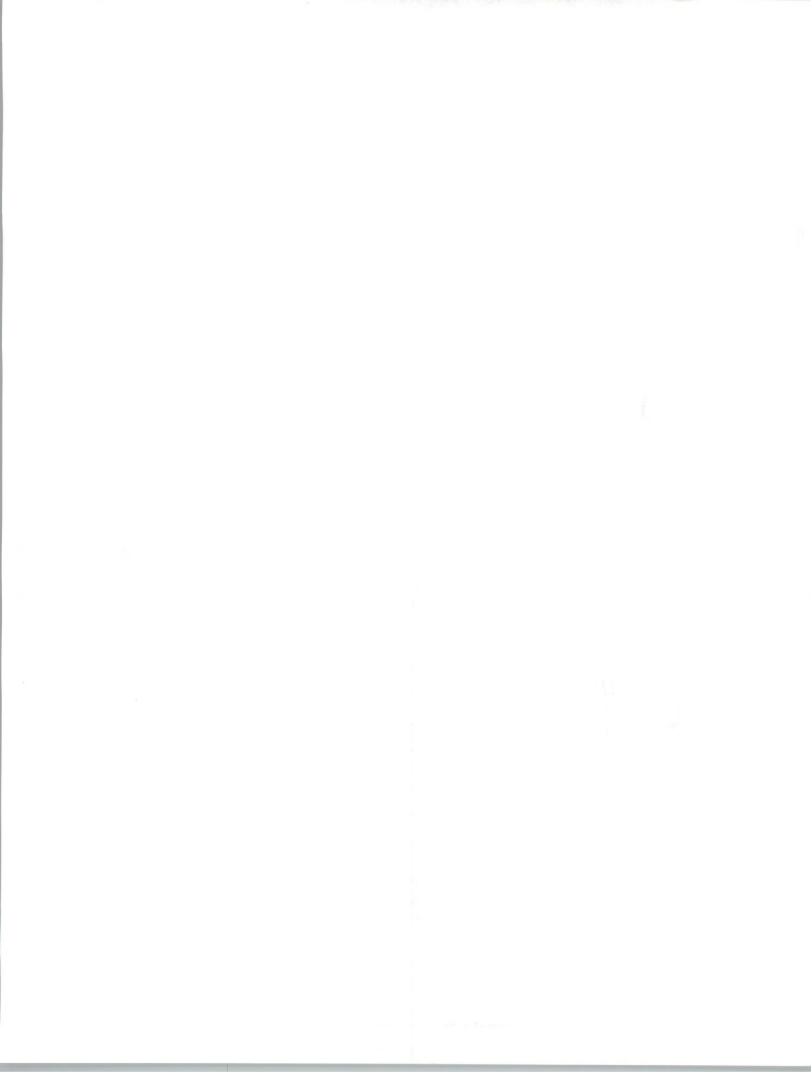
2. Transaction Volumes

Because users make use of processing services on a pay-as-you-go basis, there is inherent variability in the use of the services. Vendors need to constantly focus on increasing transaction volumes both to maintain a reasonable rate of growth and to compensate for the normal loss of business to in-house and other options. In some cases, increased volume involves expanding service offerings. Vendors that have been successful in the finance sector should look for new services to offer this market to address additional needs. As transaction volumes for certain applications level off over time, vendors specializing in one industry may need to look into servicing other vertical markets that may be growing at a faster rate.

Other opportunities for growth include expanding geographic coverage. As companies expand the geographic boundaries within which they do business, vendors must be able to also expand coverage to maintain the business.

3. Specialized Needs

Certain industries, such as banking and finance, have predominantly used processing services. Companies in these markets have made ongoing use of processing services for certain applications. As they have expanded their own service offerings into new domains, they have also used processing services vendors



for new applications. While these markets will continue to represent the largest expenditures, opportunity for significant growth exists most in those markets that have made less use of processing services in the past. Health care, for example, represents new opportunities due to the need for on-line claims processing. Telecommunications is another industry where new requirements are occurring. Vendors need to carefully select new markets and develop in-house expertise based on the business requirements of those markets in order to package appropriate solutions to the requirements of these buyers.

4. Breadth of Services

With the recent move toward open systems and away from proprietary solutions, buyers have indicated they want to have alternatives in order to be able to select the best alternative without being committed to only one application solution. Processing services, while offering distinct advantages for some requirements, is not going to be the most competitive solution to all requirements for all buyers, and most vendors have realized the need to offer related services to support their business growth. This will continue to be an important strategy. For some, a vertical market focus will be most effective, with processing services solutions for specific applications offered along with such services as applications software, consulting, or turn-key systems. Many large providers may provide system operations and system integration services along with processing services across many vertical industries.

As buyers' focus continues to be on "solutions" rather than a particular technology, it will be important for vendors to demonstrate both an understanding of the business requirements of that industry and the ability to offer a variety of options to address those needs.



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Network Services Market Analysis

A

Industry Status and User Issues

1. Network Services Marketing Trends

The market for network services has expanded over the past 10 years as a result of:

- Strong user demand for network services
- Global demand for Electronic Information Services (EIS) and network applications
- Continual improvement of network services
- The availability of network technology upgrades

Users have shown increasing interest in network services, which has led to increased use of these services. In an effort to satisfy user demands to access electronic information, vendors provide services and applications that offer information about materials, production processes, business activity, financial markets and a host of other topics.

Network services are a critical part of the overall business process for many organizations. Businesses' dependence on network services will increase as more services become available.

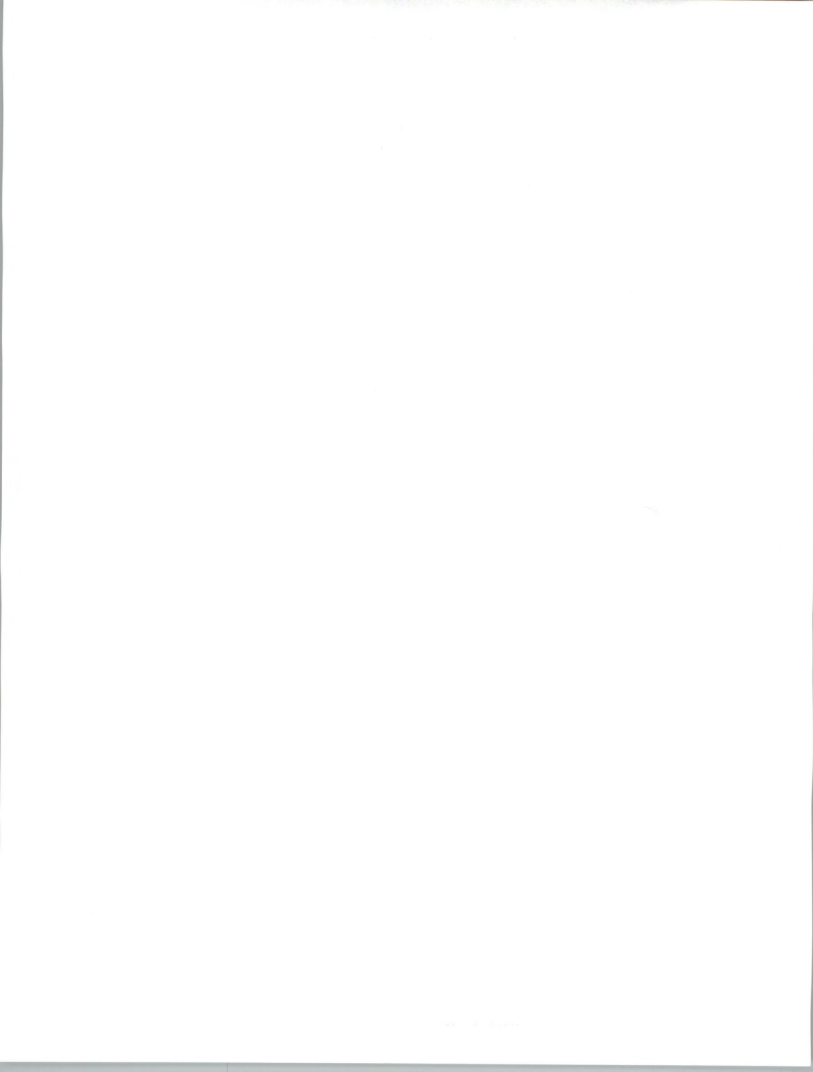


Furthermore, demand for network services within the global economy is expanding because organizations handle many business functions on a worldwide basis, such as credit checking, engineering, shipping, trading and travel. Particularly in trading situations, the availability of on-line data is essential for evaluating global opportunities. Also, network applications serve banks, other financial institutions and corporations on a global basis. Eliminating delays in initiating business activities or resolving problems, messages and payment instructions from one country to another are of major importance to multinational corporations.

Constantly improved network capabilities that allow contact with more U.S. and international end-points, as well as technology that accesses and transmits data faster, also drive EIS and network application use. From a vendor point of view, users reacted favorably to increased availability of on-line information, as well as increased access to the infrastructure for on-line information (such as EDI).

EDI (Electronic Data Interchange) implementation is most cost-effective between companies with stable trading relationships. Consequently, organizations tend to only integrate their larger strategic trading partners. Thus, vendors should investigate the opportunity presented by those companies and industry groups where the factors of support and mutual cooperation are present. Users are integrating EDI, electronic mail and other network applications into their Information Systems (IS) primarily to satisfy:

- Intercompany pressures, as well as pressures by suppliers and/or customers, to quickly communicate information. Electronic mail and EDI can quickly transfer data to remote company locations, clients and suppliers.
- The desire to save time and funds by moving information electronically. The increased speed of obtaining information over the last few years resulted in expanded opportunities to gain revenues and save costs.



Network services buyers believe these services are a necessary way of doing business rather than an enhancement to their business activities. Additionally, users expect EIS and network applications to increase revenues or reduce costs.

The trend of greater dependence and global expansion of network services supports a corresponding trend of continual improvement for these services. Developments in network technology over the last five years include:

- The use of new technology to increase transmission speeds and connectivity
- The development of multimedia
- Simplification of user operations
- The use of new techniques in obtaining data or implementing network applications

2. Vendor Strategies

In order to reduce costs and meet user service demands, vendors place high importance on productivity improvement. In addition, as a result of pressure from users to reduce service costs, vendors respond by reducing operating costs to achieve a lower pricing structure.

Vendors plan to introduce new products and services with lower price points to meet customer demands for service improvements. Vendors consider these efforts key to promoting growth in the network services industry.

New products and enhancements include:

- Additional consulting services
- Systems and application integration
- Messaging services integration



- Migration to open systems
- Distributed, integrated platform construction
- Enhancements to network throughput

Thus, introducing new technology and services is a major vendor issue. Increasing costs and narrowing profit margins make many vendors less prone to replace older technology or expand services unless there is sufficient demand to ensure success. However, some rapidly expanding firms in the network services market continue to introduce new services.

B

Driving Forces and Market Inhibitors

1. Driving Forces

One of the paramount forces driving the network services market is increasing demand for electronic information (see Exhibit VII-1).

- Additional information about materials, production processes, drugs in use, business activity, financial markets and a host of other topics are proliferating and increasing the amount of on-line information.
- On-line information can be affected by factors related to the economic conditions of users, more effective methods of using information, limitations in auditing and control of information and other influences. However, none of these factors cause users to project reductions in EIS.



Exhibit VII-1

Network Services Driving Forces

- Increased need for electronic information
- Growing pressure to use network applications to remain competitive
- Improved network capabilities
- Lack of in-house network technology and applications expertise
- Potential tool for revenue generation and cost reduction for organizations

The forces producing increased use of EDI, electronic mail and other network applications stem predominantly from two trends:

- Pressures by corporations on their suppliers or customers
- The desire to save time and funds by moving information electronically

Constantly improving network capabilities that allow contact with more end-points in the U.S. and globally, coupled with technologies that lead to faster access and data transmission, are the major forces which drive EIS and network applications.

- Electronic mail and EDI can reach more company locations, clients and suppliers
- According to users, increased speed in obtaining information over the last few years resulted in more opportunities to gain revenues and save costs

Many users do not have sufficient ongoing research and network capabilities or enough technically trained staff to take advantage of increased connectivity or speed of transmission. Major corporations indicate that it is difficult to address the scope of technological change. This uncertainty is another force that drives the use of network services vendors.



Most organizations do not have sufficient ongoing in-house technical staff that can modify an existing network to take advantage of newly introduced connectivity technology or transmission speeds.

2. Market Inhibitors

Users point primarily to three inhibitors that obstruct plans for network services (see Exhibit VII-2):

Exhibit VII-2

Network Services Growth Inhibitors

- Continued delay of economic recovery
- Expanded use of CD-ROM technology
- Lack of critical network skills

- **Delayed economic recovery.** However, some users are expanding the use of these services to stimulate business.
- **Use of alternative solutions.** Competitive products include CD ROM offerings. Significant developments in the use of CD ROM technology led to consideration and/or use of CD ROMs for economic, technical, legal and other information that does not require real-time updates. Information that is static can be provided much more economically on CD ROM than from on-line databases. There are now economic and financial databases available on CD ROM which include, in some cases, data that is also available from on-line databases.
- **Lack of in-house networking skills/knowledge/staff.** In some circumstances, users note that as a partial result of downsizing, they are left with fewer capable staff to evaluate needs and possible vendor network services. This has resulted in the delay of network service implementation.

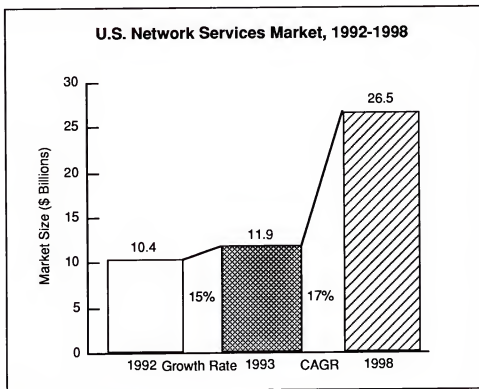


C

Market Size and Forecast. 1993-1998**1. Overall Market**

The market for network services grew from a 1992 level of \$10.4 billion in user expenditures to a level of \$11.9 billion in 1993—a slightly increased growth rate of 15%. This slight improvement of 1% also reflects user expenditures, which will now grow at a compound annual growth rate (CAGR) of 17% during the next five years to reach \$26.5 billion in 1998, as noted in Exhibit VII-3.

Exhibit VII-3



Continuing expansion in network services is because growth can assist in revenue generation or cost reduction while creating a more automated way of conducting business.

- Network applications provide electronic rather than paper means of handling business with customers, suppliers, service companies and government offices—as well as with other offices in an organization.

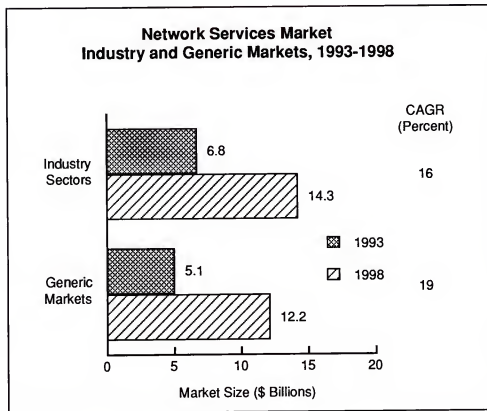


- Information necessary to make decisions, conduct research, aid clients or keep processes functioning can be sought and accessed more rapidly and on an automated basis.

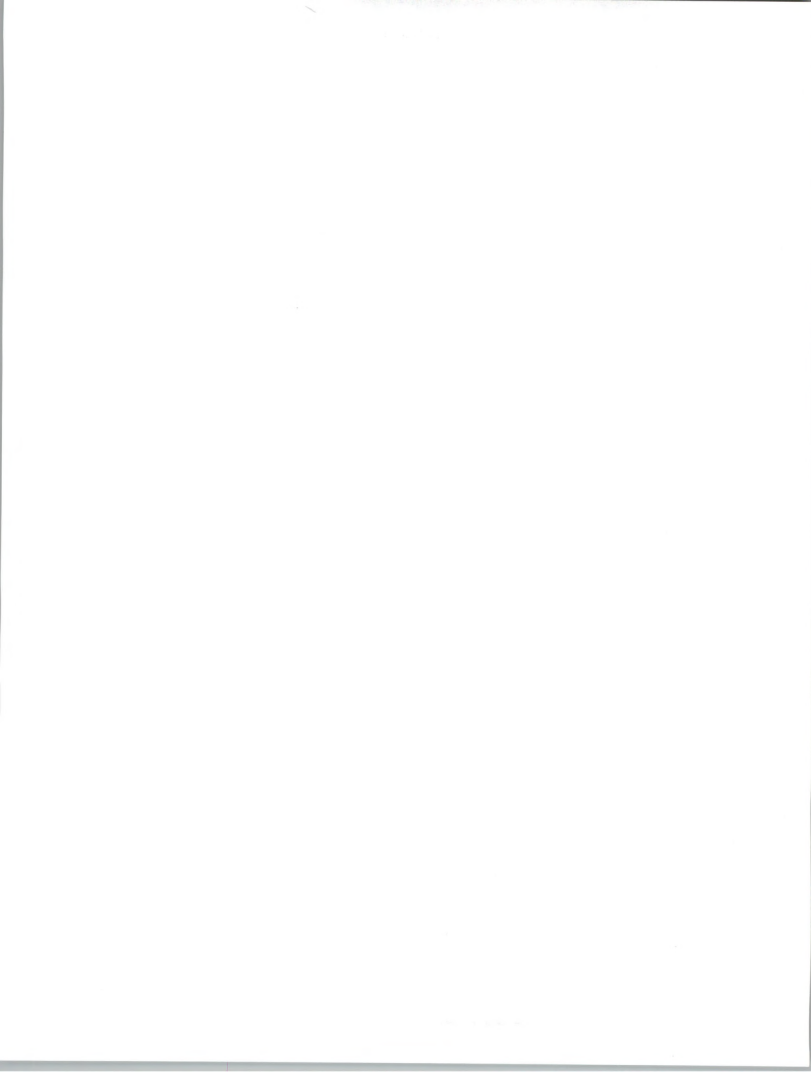
2. User Expenditures by Industry and Generic Sectors

User expenditures of \$11.9 billion for network services in 1993 can be divided among industry and generic markets, as shown in Exhibit VII-4. By generic, INPUT means this service can be used in such a broad or general way across industries or in applications, that it is impossible to divide it by cross-industry or industry categories.

Exhibit VII-4



Differences in use of network services between industry markets is pronounced, with the wholesale distribution, discrete manufacturing, telecommunications, retail distribution and state and local government industry sectors all showing growth at 20% CAGR or better through 1998. Only the utilities sector, with its stable market, will have single-digit (8%) growth.



D**Vendor Competition**

The list of top vendors of network services in Exhibit VII-5 illustrates that competitors in this marketplace come from a variety of industries.

- Competitors include publishers of financial information such as Dow Jones and Dun & Bradstreet; book publishers such as McGraw-Hill; a bank, Citicorp; the leading computer manufacturer, IBM; a newspaper holding company; two subsidiaries of manufacturers of noncomputing products; and vendors of information industry services.
- Information services vendors that offer network services tend to be known chiefly for services in other product/service markets such as ADP and CSC.

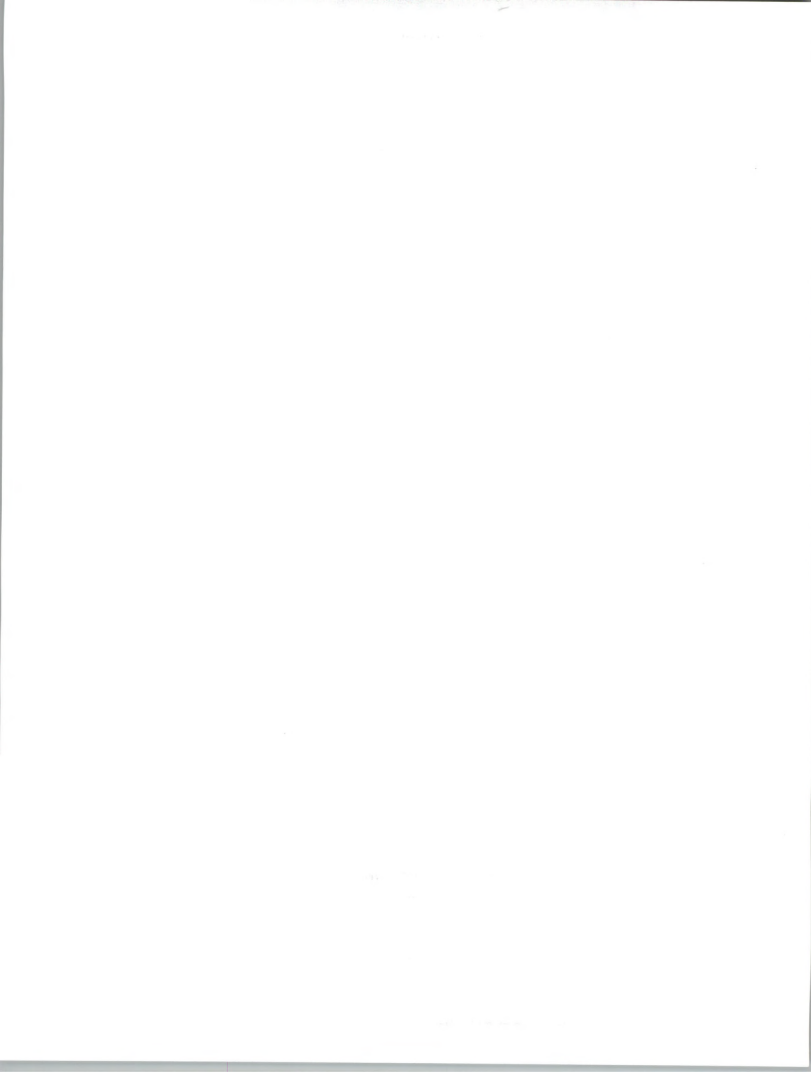
Exhibit VII-5

Leading Vendors of Network Services in 1992

Rank	Vendor	Estimated Revenue (\$ Millions)	Market Share (Percent)
1	TRW (incl. Chilton)	641	6
2	Dow Jones (Telerate)	620	6
3	Dun & Bradstreet	545	5
4	Mead Data Central	495	5
5	Equifax	435	4

Exhibit VII-5 illustrates that a group of large vendors dominates the network services market.

- The top five vendors noted in the exhibit account for about one-quarter of the 1992 revenue for network services.
- The next 10 vendors add about 30% more to the total revenue for this market segment.



The largest segment or subsector of network services is EIS. It provides almost 80% of the revenue for the network services product/service market. The leading firms in this market provide on-line databases of credit information, investment analysis and equity pricing. In addition to SE products, there are a large number of other (EIS) on-line database products that provide information on topics such as chemicals, agriculture, construction materials, audience ratings and other subjects.

A number of information providers now supply paper-based products or processing services that could expand into EIS in the future.

- IRI and other vendors now use disks, paper or other media to deliver information to clients about sales data they have captured, organized into databases and used to prepare reports and sets of information about buying patterns. Some of these vendors plan to make more information available to clients through on-line databases.
- Some telemarketing and TV buying services—such as Information Resources—that utilize databases in their internal work may allow clients to access that data on-line.
- Companies with databases of printing templates, overlays or text to aid in the processing necessary to create catalogs or directories, are contemplating services allowing clients to use terminals or PCs to access that information for in-house work.

Nynex, an information provider, just announced their transition plans into EIS. Teaming with Prodigy, Nynex will offer on-line Yellow Pages business listings in the New York/New England area. Nynex will expand the service either by licensing the new software to other RBOCs or by becoming a national provider themselves.

Subsectors of network services do not tend to cross-sell each other and generally do not have business characteristics that would make it sensible to combine subsectors.



E**Conclusions and Recommendations**

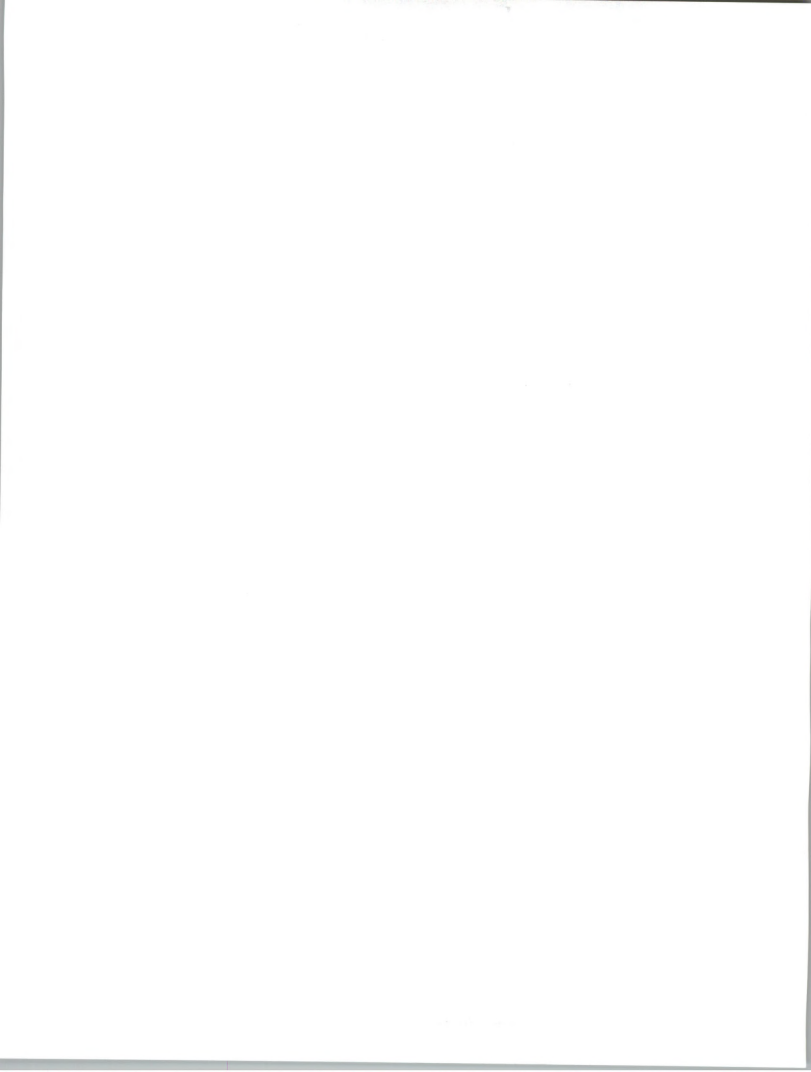
1. Conclusions

INPUT believes that any impact of the current recession was more than offset by a significant and continuing need for network services. This was due to the increasing need for electronic information.

- Information about materials, production processes, business activity, financial markets and a host of other topics contribute to increases in the amount of on-line information.
- In addition, forces producing increased use in EDI, electronic mail and other network applications stem from pressures corporations place on their suppliers and the desire to save both time and expense by moving information electronically.

In the network services marketplace there was no strong recessionary reaction to lead to an aggregate reduction in the use of electronic information services, value-added networks, EDI or other network applications. The economic slowdown, however, caused individual firms to limit planned use. The overall result of this recession caused buyers to become more active in identifying competitors that can deliver similar services at reduced prices.

In conjunction with the economic downturn, there has been a significant trend toward business downsizing. In many cases, the need for a corresponding reduction in network size and cost created the need for better network planning. With fewer in-house resources, some users experienced more difficulty in analyzing and re-engineering to satisfy network service requirements. Vendors responded by providing increased aid in planning these network services.



Network services buyers are demanding additional services and aid from network services vendors as part of buyers' present service and fee agreements. Buyers want a means to improve productivity, as well as a way to offset reductions in user staff. Buyers are also more concerned with planning and justifying the use of network services.

Improvements in technology, such as client/server architectures, database developments and network interoperability (LANs and WANs), stimulates the use of network services. One primary driver expanding this marketplace is the increased need to interface with heterogeneous networks. Such interoperability will increase the number of end-points that an electronic mail or EDI system can contact.

Organizations pushing to upgrade interfaces to heterogeneous networks that will allow interconnectivity between geographically dispersed offices, are creating enterprise networks. Developing standards in network technology also helps this movement by documenting procedures that allow common interface points for multiple network platform interconnections.

On the demand side, availability of higher line speeds convinced companies that it makes more sense to use electronic mail between sites or to reach customers—e.g., to aid in sending information to order points or manufacturing sites. Higher transmission speeds also promote increased use of EDI and development of multimedia applications. Application systems that will use image processing are now planned and implemented in various industries.

Additionally, the user's role concerning deployment of information technology continues to increase. In many instances, the user is more influential than the information systems manager. In the future, the user's purchasing influence will have positive impacts on size and growth of the Information Services industry.



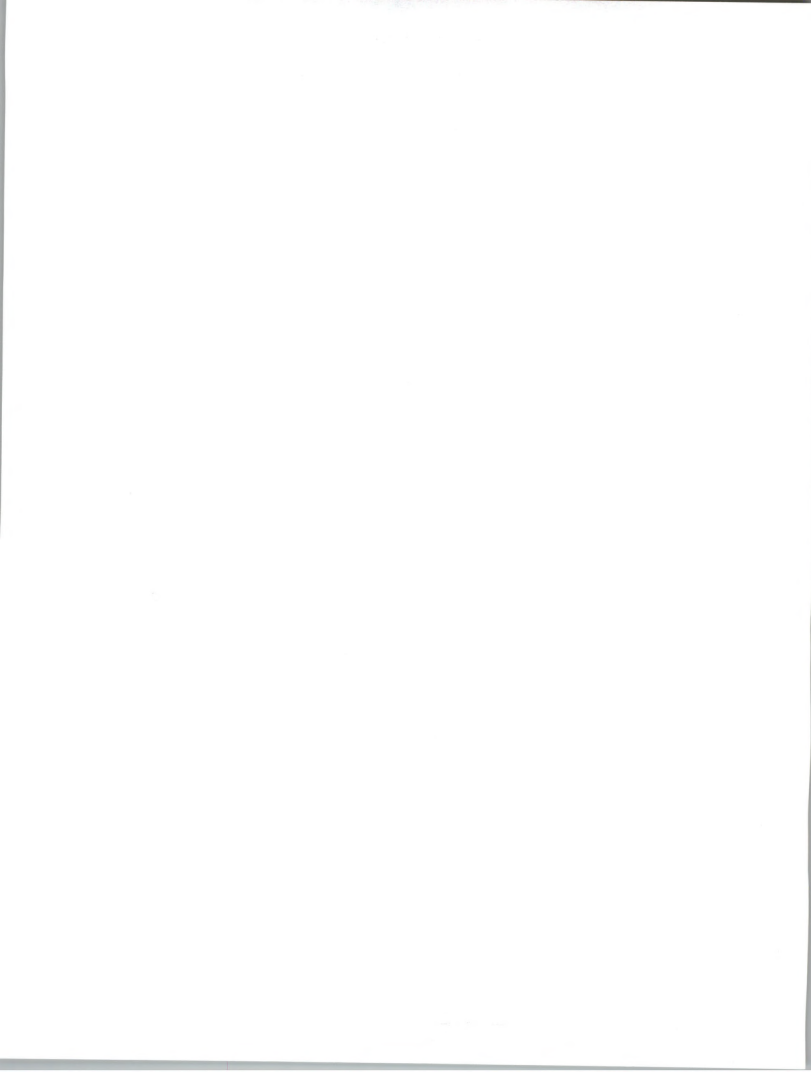
2. Recommendations

It is apparent users are focusing more on their core businesses than in the past. Vendors should view this as an opportunity to provide a tailored service that performs all transaction/network services (including many of the ancillary business functions currently performed by the user). Because many users want to meet the demands of a global economy, network service capabilities that support international requirements will offer a competitive advantage. For the smaller niche market vendor, alliances with foreign carriers may be beneficial.

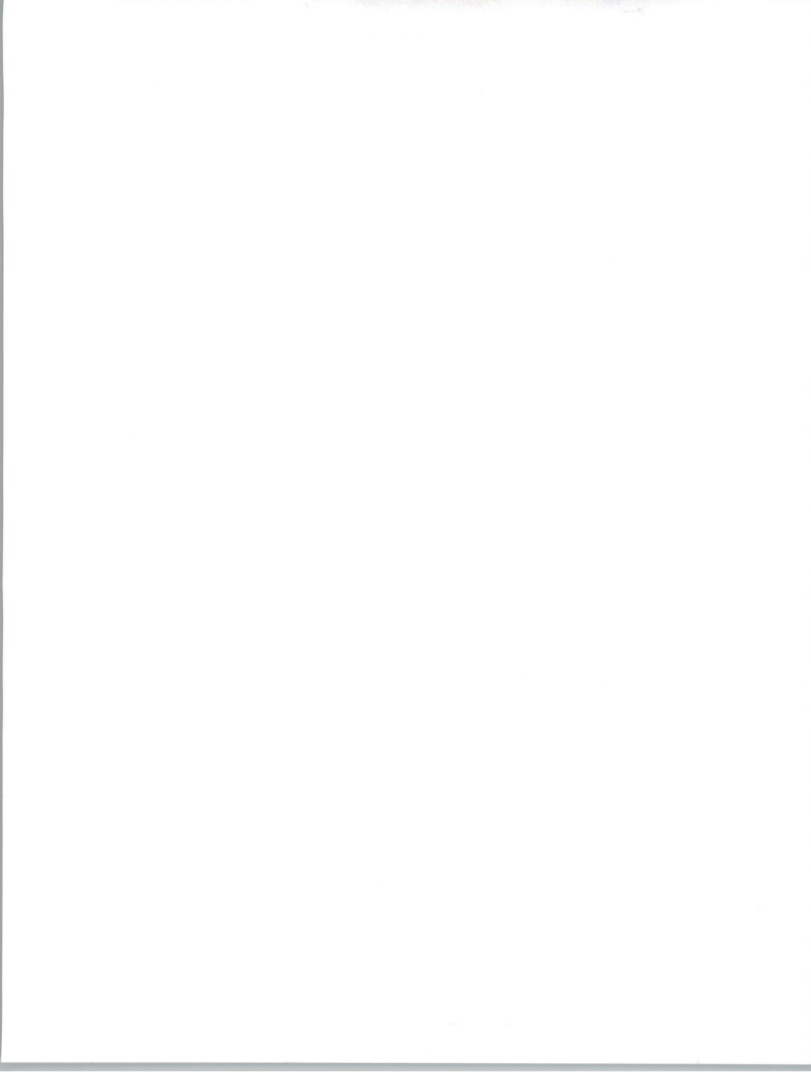
An additional service that vendors of EIS should consider is providing data on CD ROM, together with new software products that can access that data. This approach is especially effective for static data in on-line databases. EIS vendors can provide CD ROMs along with software products that organize data or provide references between on-line and CD ROM data sources.

With technology changing so rapidly, it is imperative that vendors stay in tune with its evolution and plan for potential opportunities. Vendors must position themselves to support any-to-any network connectivity. This connectivity will include interoperability of EDI, electronic commerce, imaging and even the possibility to support certain segments of a user's enterprise network. As multimedia technology develops, users will make significant commitments to this audio, image, full-motion video and textual medium.

The network environment, as with other elements of the IS network, has become heavily influenced by users. Network service vendors must recognize this role change. Users now want to be involved in planning and operating EIS, EDI, electronic mail and other network applications systems. However, users have difficulty evaluating, selecting and operating a network service. Thus, more than in the past, vendors need to take a consultative approach and explain the network applications or software provided with an EIS to help users understand and evaluate what their network services can accomplish.



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Applications Software Products and Turnkey Systems Market Analysis

The application solutions market is defined by INPUT as two product/service markets: applications software products and turnkey systems.

This chapter presents overall growth projections for applications software products and turnkey systems, and draws conclusions about this fast-moving portion of the information services industry.

A

User Issues

1. Growing Importance of the User

In analyzing IS corporate buying patterns, it is important to ask who is shaping the solutions buying trends, and who is actually buying the software to support these solutions.

The user, including individual business unit managers, is exerting much more influence than in recent years on corporate IS buying patterns. Exhibit VIII-1 lists several ways this is happening.

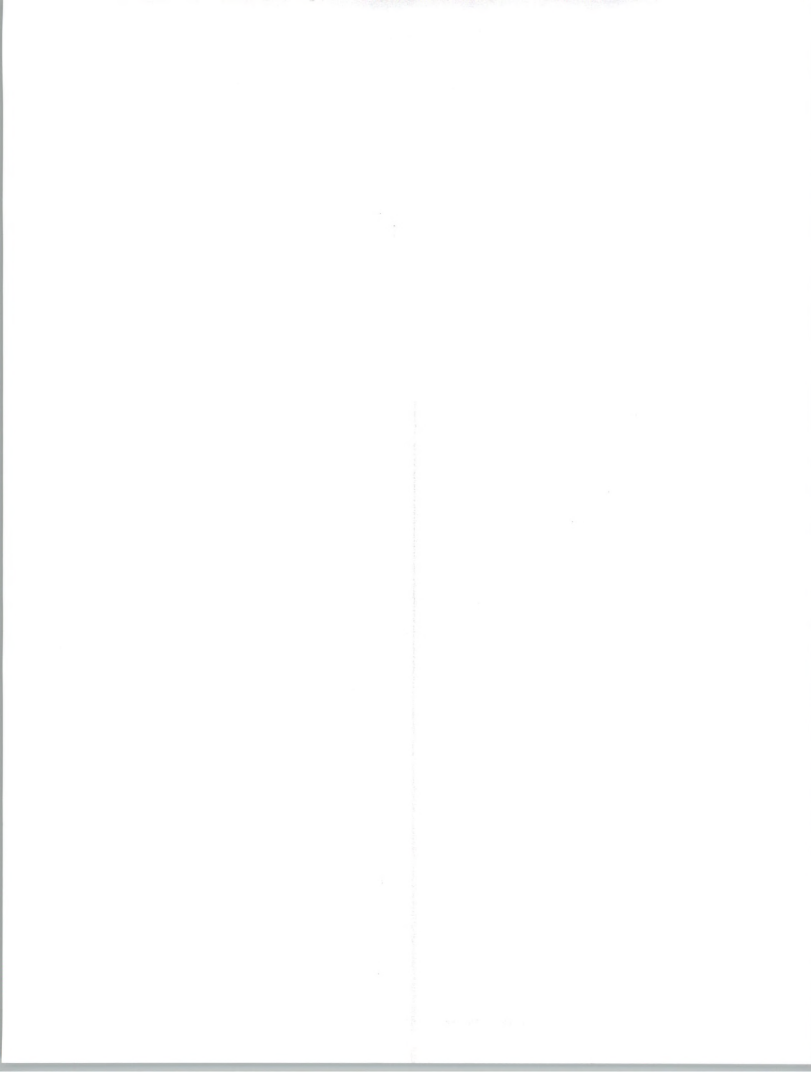


Exhibit VIII-1

User-Driven Environment

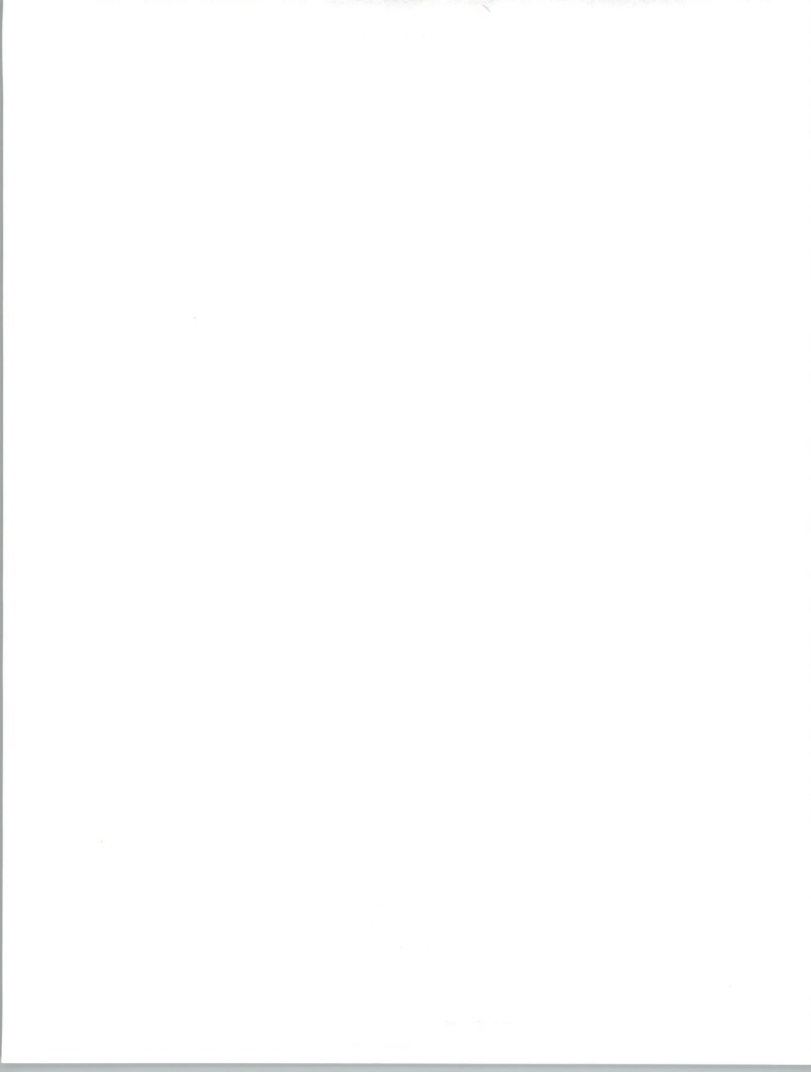
- Packaged solutions sought
- Limited internal development resources
- No interest or knowledge of operating systems/networks
- Will seek outside support to modify standard package

The typical user is not a "techie," wanting to learn about technology for its own sake. Today's users focus on computing technology as a tool, much like paper and pencil, to address business issues. Business people, for the most part, are no more interested in bits and bytes of computing than they are in the mechanics of manufacturing the paper they use.

As IS organizations become smaller, there will be limited resources to develop in-house solutions. Because the user does not have the skills or the interest to develop applications, off-the-shelf solutions will become increasingly in demand. Users don't want to worry about database management, operating systems, network management or application integrity. What they will generally do is seek help to modify standard software products if packages do not meet specific needs. This need for customization can bode well for turnkey vendors and VARs that bundle additional support with software solutions.

Traditional software products will lose acceptance in this new world if they don't allow easy modification through scalable options, templates and hooks. This applies not only to PCs but also to minicomputers and mainframes.

Although user involvement is increasing, many applications are still within the domain of IS. The stumbling block for vendors here is the long-held belief that many applications, particularly those that are industry-specific, must be developed in-house. Even with increasing development backlogs, lack of programmers and a trend toward outsourcing, many companies still spend more on internal development than on applications soft-



ware products. Vendors must entice these buyers to consider packaged solutions. One approach by vendors has been to provide not only product flexibility and customization tools, but also services in support of users' unique requirements.

B**Vendor Issues**

As a result of recent trends, applications software and turnkey systems vendors need to address a number of new issues in several areas. These are shown in Exhibit VIII-2.

Exhibit VIII-2

Vendor Issues

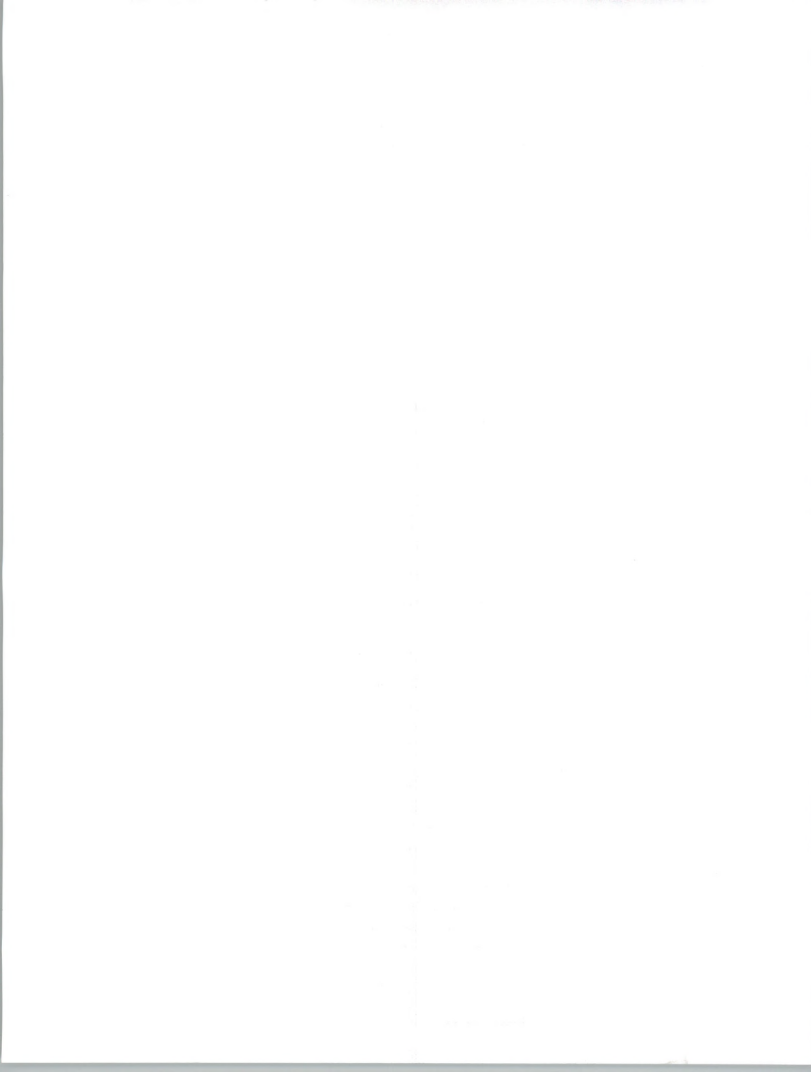
- Changing market
- Pricing
- Marketing issues
- Alliances
- Open Systems

1. Changing Market

Downsizing and increased involvement of users in purchasing decisions are dramatically changing the application solutions market.

In the old mainframe/IS shop environment, software features tended to be relatively fixed until the next release. In today's world, technology and customer needs change quickly. To be competitive, solutions must be flexible, allowing features to be constantly added. Frequent updates are a fact of life.

When sales were primarily focused on IS, applications software vendors traditionally relied on a field sales force. Software sales were for high-ticket items sold to a relatively limited number of buyers. Today, instead of hundreds of buyers of host software,



products are sold to tens of thousands of users with the average price tag at hundreds of dollars rather than thousands of dollars. Clearly, this resulted in a need to change the way applications software is marketed.

Sales strategy should use a variety of channels, including direct and indirect sales, to be cost-effective and reach a broader prospect base. Sales costs have traditionally been labor-intensive, relying on representatives approaching prospects one by one. Today, more dollars are being spent on advertising and promotion.

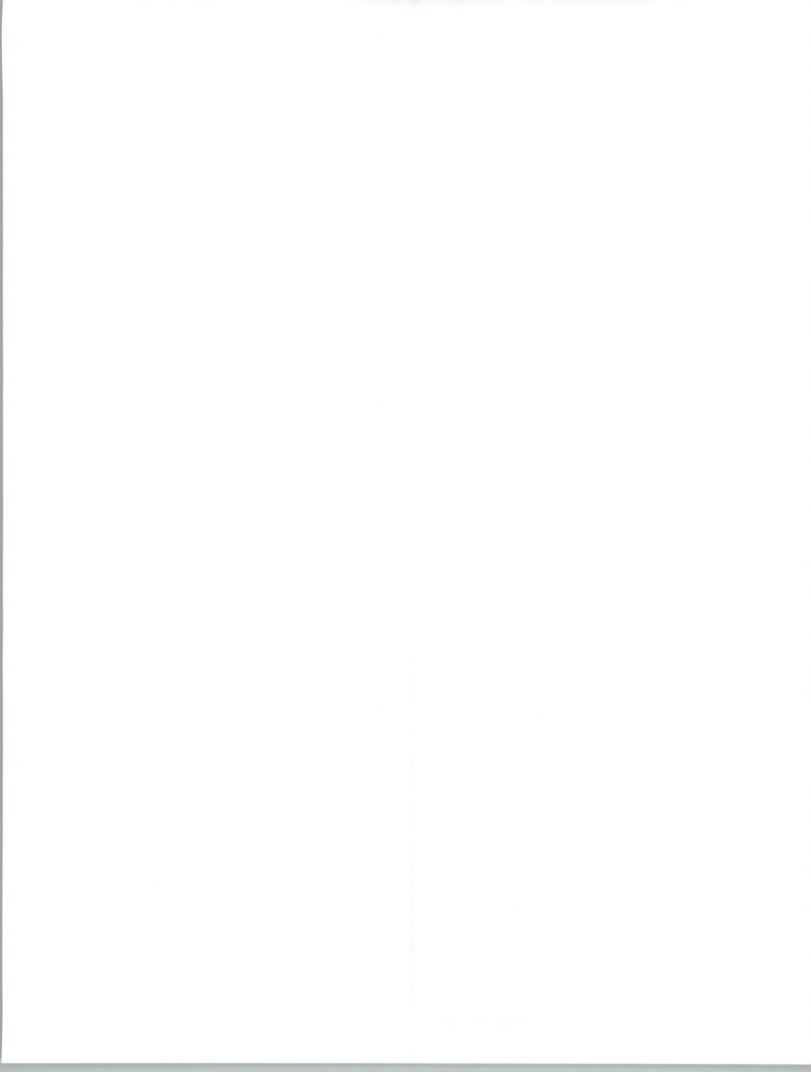
2. Pricing

Tiered pricing has been the mainstay of IS software purchasing. The larger the system, the more value was gained from it, and software prices increased accordingly with hardware size. Advances in workstation/PC capacity in recent years, along with the proliferation of LANs, have forced providers to rethink pricing strategies.

As users link their PCs onto LANs, users expect price breaks compared to software on individual PCs. Vendors offer six-pack products for LAN usage; however, in many cases users complain that the savings are insignificant and not enough copies of documentation are provided.

As companies downsize and consolidate data centers, they demand changes from tiered pricing. Some users have been deterred from consolidating applications onto large systems because tiered pricing makes the cost prohibitive. Still other companies complain that they are unwilling to pay the high costs for applications that are not widely used but, due to system upgrades, happen to reside on a mainframe. As costs for hardware go down, users are increasingly unwilling to spend a disproportionate amount on software.

This has led to user-based pricing schemes. One approach is referred to as "designated user," where software purchase/licensing is based on the number of users and each package is designated to a specific user. Another user-based pricing scheme is the concurrent license, where the number of users that can access the software at any one time is limited, but does not require specific users to be designated.



Vendors also enter into various creative licensing agreements with large corporate customers. These arrangements will often allow unlimited copying within some specific reporting boundaries.

Computer Associates (CA) has developed an enterprise license program that allows the customer to use a program on any computer. Rather than basing fees on the size of the machine, the fee is based on total number of MIPS used by the enterprise. CA also provides credit for the amount of time an application has been on a smaller system and applies that toward the migration of software onto a larger system.

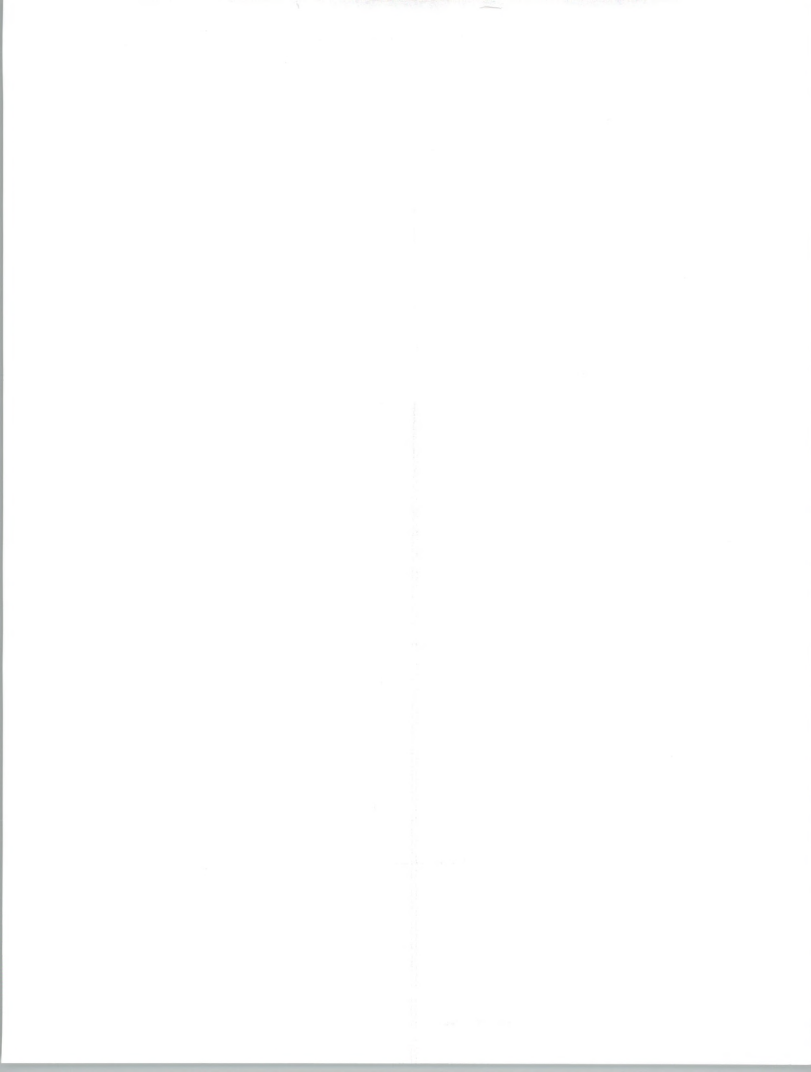
Another approach is usage-based pricing, where the user is charged only when the software is being used. This creates complexities related to monitoring usage that can be difficult to implement. Proginet Corp. has its Software Meter utility, which monitors how often mainframe software is used.

With trends toward downsizing, client/server architecture and shared networks, pricing issues have become more complex. Client expectations are changing, as show in Exhibit VIII-3.

Exhibit VIII-3

Pricing—Customer Expectations

- Bundling—users want it both ways
 - Advantages of bundled pricing
 - Only bundle what user needs
- Client/server pricing
 - Isolated or shared mode
- Pricing options: purchase, lease, usage, bundled, subscription



Users want pricing options to meet various needs. They want the advantages of bundled prices but want to have bundling include only those specific applications needed by the user. A client/server pricing sector must be provided. Pricing packages must include a variety of options: purchase, lease and usage-sensitive. Flexibility and responsiveness to user needs will be the keys to successful pricing strategies.

3. Marketing Issues

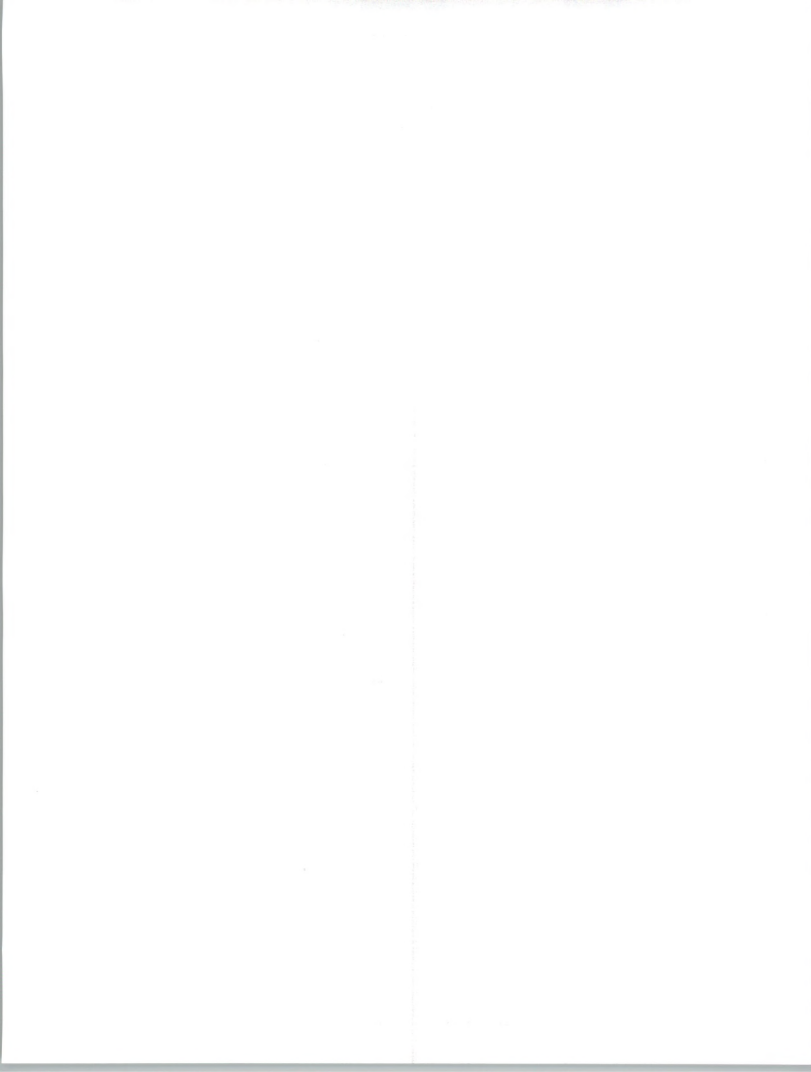
Given the large number of potential buyers for software, which is continually lowering in price, marketing is becoming more challenging. Vendors must look beyond direct field staff to sell their products to the mass market. They need to rely on a variety of channels—including direct mail, advertising and third-party VAR channels. The large, established vendors clearly have an advantage here, because they have the deep pockets to support such approaches.

Software Suites: Vendors who offer a variety of products leverage their success in one area to gain overall market dominance through the packaging of software suites.

While not all vendors have the option of providing a suite of products, some form co-marketing agreements with providers of complementary products.

Software Bundling: Given the competitive software marketplace, vendors are developing a variety of arrangements to increase market penetration. One approach is to have equipment vendors bundle in software as part of the hardware purchase. This trend is expected to accelerate as one example of new versions of turnkey systems sales by equipment vendors.

These deals can result in software being offered for less than \$100 while customers would have to pay \$200 through a dealer. While this approach is beneficial in increasing market penetration, it will continue to drive prices down.



Alliances: Alliance activity among vendors is expected to accelerate. Companies are entering into relationships ranging from co-marketing agreements to joint development efforts.

Vendors realize they can't be all things to all people. To keep pace with new technology, they must link up with others who may have complementary marketing and support/service programs as well as software that could be integrated as part of a solution.

4. Open Systems

Users look for software to address their business needs and want those solutions to be available regardless of the hardware used. As companies move toward increased use of EDI and other forms of electronic communication, solutions that succeed will be those that are platform-independent. While the move to an open systems environment has not been fully accomplished, software providers need to focus their development efforts on functioning in the open environment of the future.

C

Market Size and Forecasts, 1993-1998

User expenditures for applications solutions are forecast to grow at a 13% compound annual growth rate (CAGR) over the next five years, reaching \$68.3 billion in 1998, as shown in Exhibit VIII-4. This represents a 1% increase from the CAGR in INPUT's 1992 forecast for the applications solutions market.

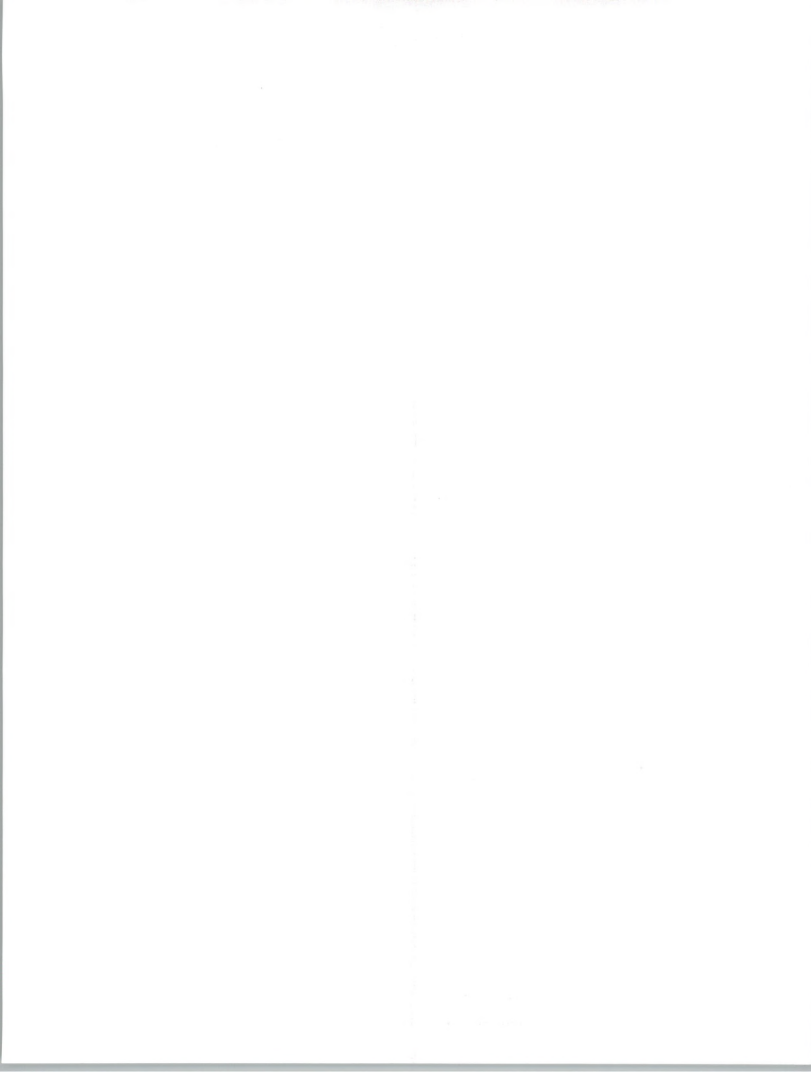
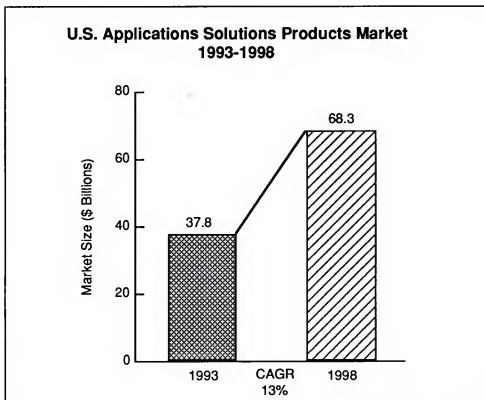


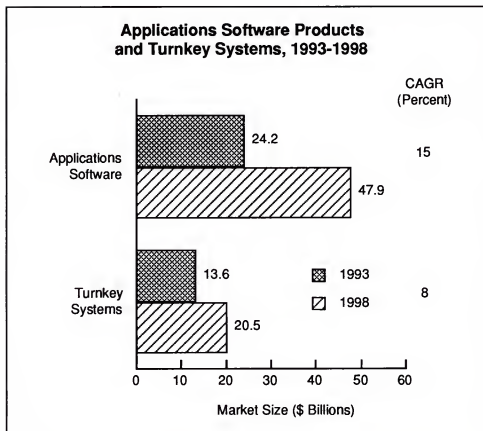
Exhibit VIII-4



The forecasted growth rate for the turnkey systems market remains at 8%, compounded annually (see Exhibit VIII-5), whereas the growth rate forecast in the applications software products market segments increased from a 14% CAGR last year to a 15% CAGR in the current forecast. The principal variances in the growth rate projections are in a slightly higher growth rate forecast for PC/Workstation application software products and a slight revision upward in the projection for systems software growth in the turnkey system market segment.



Exhibit VIII-5



A growth impetus for the applications software products market is expected from new client/server applications. However, INPUT believes there will be considerable disparity in the success levels of individual vendors with their client/server products. The ability to migrate a current customer base to the newer product will be particularly important. In addition, future pricing trends for client/server products are still unknown. Pricing should show more strength for products that can truly provide a value-added alternative to existing legacy systems. These represent a second-generation client/server technology, based on a more stable distributed relational database model, and will provide more of a server-to-server-based solution. Current generation products, which have a heavy emphasis on front-end, client-based decision support, are expected to exhibit early price erosion.



The two product/service markets, applications software products and turnkey systems, will continue to converge over the next five years. A total solutions marketing approach (large vendors providing bundled "open systems" solutions) will be the most successful for addressing the large in-house corporate application development market. In addition, large vendors can leverage their marketing and support infrastructure by reselling independent software vendor products. Thus, the size connotation of a VAR may change considerably over time, from primarily small to mid-sized vendors to more of the large computer systems and systems software vendors.

Distributed processing adds to the complexity of the user decision process. However, it appears from recent financial reports from companies providing client/server solutions that the market for such products is now moving from an user evaluation phase to actual product implementation.

In addition, there is speculation that a number of corporations are developing client/server applications, but for competitive reasons don't want to provide many details on their activities.

D

Vendor Competition

The leading applications solutions vendors are shown in Exhibits VIII-6 and VIII-7. Revenues for each company are developed from INPUT's vendor files and surveys.



Exhibit VIII-6

**Leading Independent Vendors
U.S. Packaged Software Services 1992 Revenue**

Vendor	1992 Revenues* (\$ Millions)
Microsoft	520
Lotus Development Corporation	360
Computer Associates International	270
Policy Management Systems	330
Dun & Bradstreet	260
Cadence Design	163
Borland International, Inc.	140
Electronic Arts	135
Autodesk	115
WordPerfect	115
SAS Institute	110

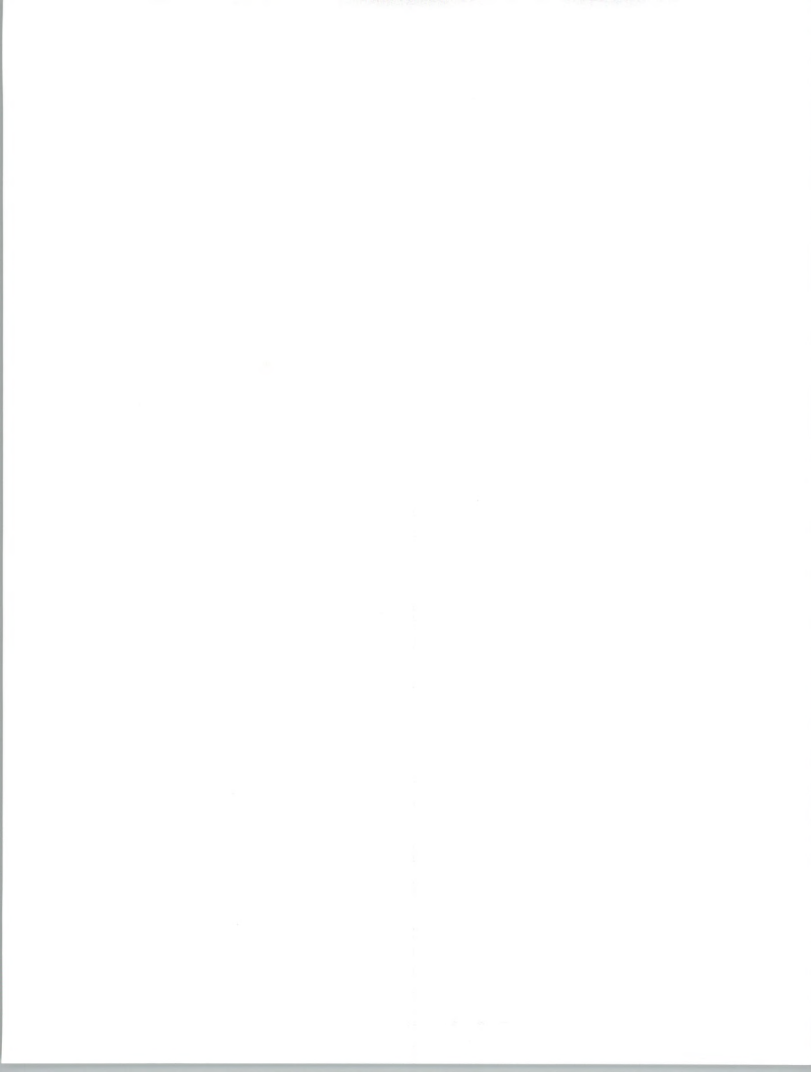
* INPUT Estimate, revenue includes U.S. revenue for packaged software which in some cases includes systems software.

Exhibit VIII-7

Leading Turnkey Systems Vendors*

Vendor	1992 Revenue (\$ Millions)
Intergraph	1,180
Mentor Graphics	400
Reynolds & Reynolds	250
ASK Computer	180
Octel	190
Filenet	140

* INPUT Estimates



The largest vendors in the 1990s will not necessarily be the same as the leaders in the 1980s. Companies will not only need major marketing and services support capabilities but, as the market switches to client/server architectures, vendors who successfully re-engineer their software in a timely manner will be positioned for continuing leadership. A number of leading applications software companies had significant disruptions during the 1992-1993 period in their traditional above-average growth patterns, due to factors such as increased competition and the impact of downsizing on companies who have not re-focused product direction toward the client/server architectural environment.

Although computer systems vendors that also sell their own software bundled with their general-purpose hardware are not considered for this report to be turnkey systems vendors, in the future their product offerings are expected to provide more total applications solutions. In the future, composition of the applications solutions market will change to include other traditional product/service market vendors, such as systems integrators, equipment vendors, professional services/systems integration and systems software companies.

E

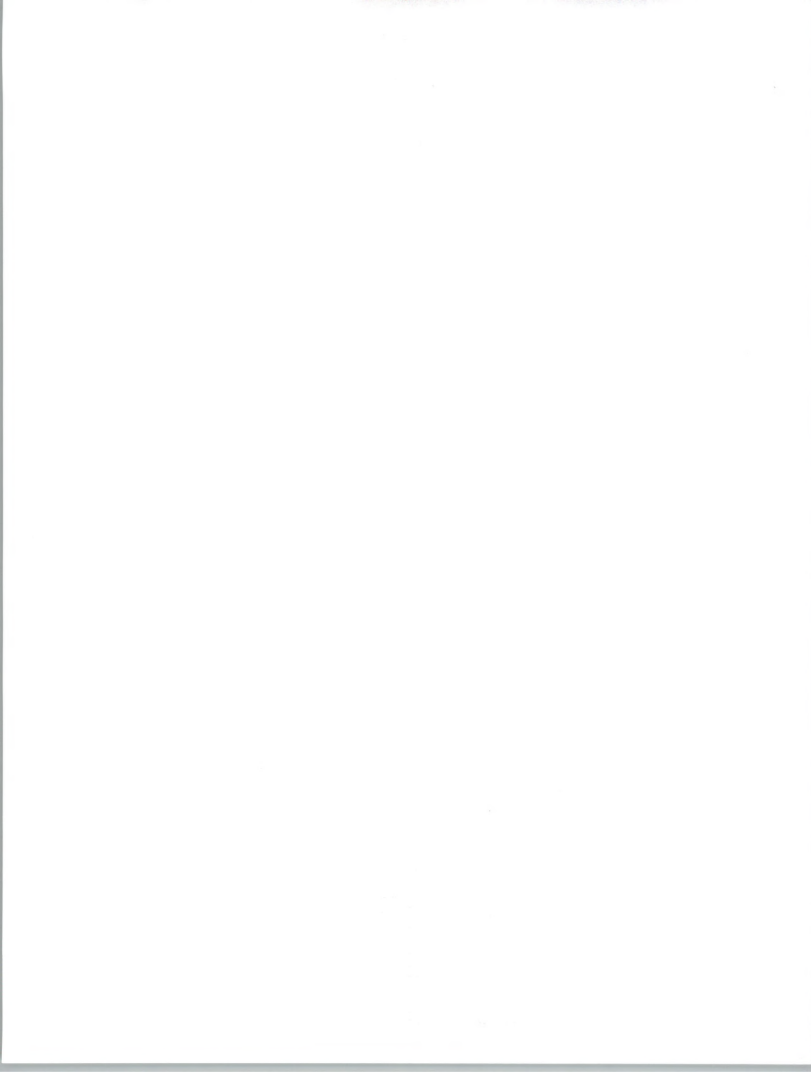
Conclusions and Recommendations

Exhibit VIII-8 outlines INPUT's conclusions for vendors focused on providing applications solutions.

Exhibit VIII-8

Conclusions

- Downsizing is changing the applications solutions market
- Enterprise computing is the model for the 1990's
- Strategic alliance activity is accelerating
- Product delivery will shift toward more solutions selling
- Application solutions vendors will compete with other service delivery modes
- Market will consolidate (big vendors will keep getting bigger)



Downsizing is changing the applications solutions market:

Functions that previously were handled in a host environment are now distributed from host to servers on LANs, with the host serving as a data repository. Most IS decision makers and vendors expect to downsize key applications within the next five years.

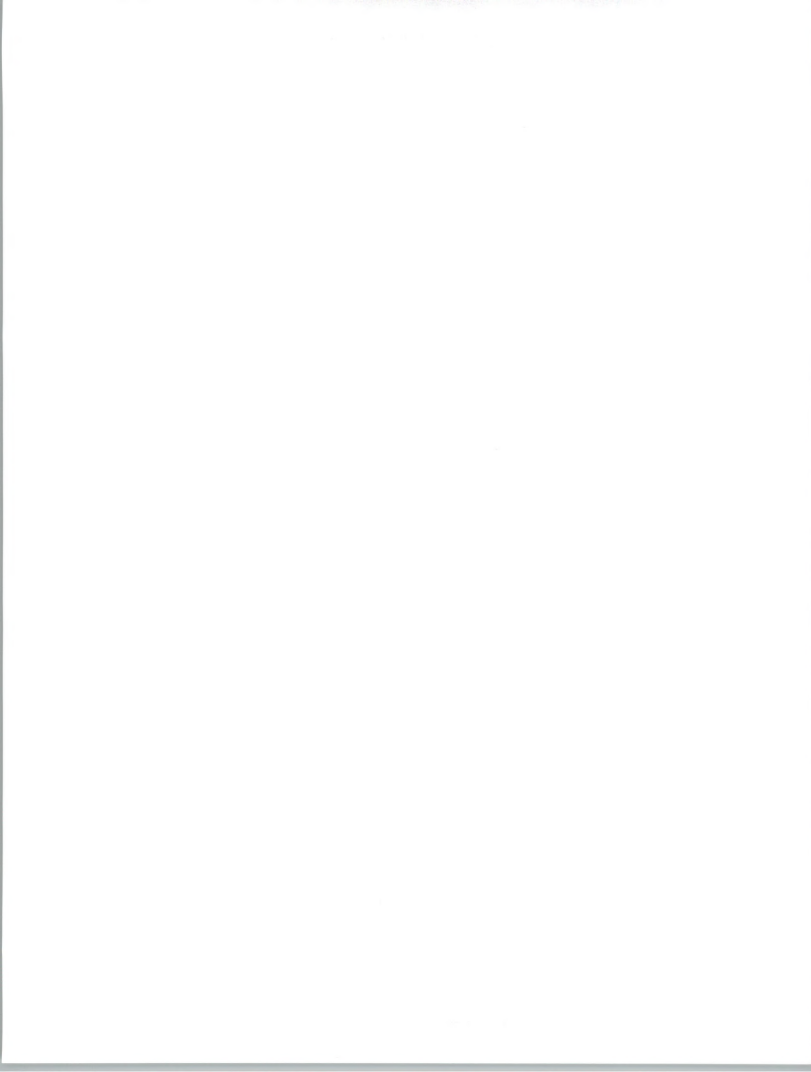
Enterprise computing is the model for the 1990s: While main-frame and midrange systems controlled mission-critical applications in the past, the PC was the domain of personal productivity and analysis tools. Today, the trend is toward downsizing host applications and making use of all three of these platforms, using the hardware that is most functional for a particular application. Platforms are linked through networks and data is integrated through database management systems.

Strategic alliance activity is accelerating: INPUT's vendor surveys show acceleration in strategic alliance activity. More recent alliance trends have been with computer systems (equipment) and systems software (application development tool) vendors.

Much of the current strategic alliance activity appears to help accelerate the product development process. In the future, more marketing and product support alliance activity is expected, with many computer systems and systems software companies becoming major participants in the VAR distribution channel.

Vendor consortiums to provide product interoperability are also increasing, and industry consolidation is expected to accelerate with the complexity of client/server product delivery, creating a sharper division between industry success and failure scenarios.

Product delivery will shift toward more solutions selling: The increasing complexity of products creates a product-support nightmare. In the future, users will look more to single-point suppliers of total solutions and support to improve the efficiencies of distributed processing applications. This will require well-defined product and support marketing consortiums that users can look to for long-range product planning and implementation.



Applications solutions vendors will compete with other product/service markets: As software vendors become more service-oriented, it will become increasingly difficult to differentiate software companies from systems integrators and professional services companies. The current principal differences in product/service market definitions between applications software products, turnkey systems and systems suppliers will also blur over time.

Big vendors will keep getting bigger: In an industry where small companies still are plentiful, certain leaders achieve dominance, which affects the ability of smaller vendors to compete. Growth for larger vendors is achieved through acquisition and market share expansion. Alliances and cross-marketing agreements also increase market penetration for particular vendors. This leaves the smaller vendors to fill niche markets or align themselves with other, more dominant vendors with complementary products.

Recommendations to vendors are listed in Exhibit VIII-9.

Exhibit VIII-9

Recommendations

- Develop total solutions marketing capabilities through products and services alliances
- Support industry standards as they develop
- Move product orientation to a client/server architecture as early as possible
- Acquire application development tool technology to provide product flexibility

Develop total solutions marketing capabilities through products and services alliances: Vendors should develop a partnership with a vendor of complementary products and services to reduce costs of marketing and support, and also address the largest available software product opportunity: the current corporate in-house development market. This user community will increas-



ingly require product breadth and flexibility as well as a strong source of product support. A single software vendor will find this an increasingly difficult market to address as an independent, particularly as products require more interoperability or total solutions capability.

Support standards as they develop: In this fast-changing industry, it has been difficult for true standards to be developed. While users and vendors alike have recognized and been moving toward standards and open systems, it has been a slow process complicated by the myriad of new product introductions that have taken place along the way.

Vendors must be aware of unofficial standards as they develop and prepare to offer products that conform. This becomes increasingly important when providing cost-competitive products to users. Buyers seek solutions that will work on multiple platforms and operating systems. Product standardization will make it easier for buyers to make use of technology as a tool to support their business while being insulated from the technical aspects of computer systems.

In order to support a multivendor and multiplatform strategy, turnkey vendors must either diminish reliance on hardware or support a broad range of hardware platforms. Vendors are under more pressure to open up their systems. Customers may still want a "traditional" turnkey systems solution, but don't want to feel limited to specific hardware.

Move product orientation to a client/server architecture as early as possible: Companies that establish themselves early as providers of quality client/server products will gain the advantage of incremental market and early strong pricing. Developing partnerships with companies that have strong application development tool technology and distributed processing architectures will provide a sound base for product architecture. Also, conformance to industry's distributed processing standards will encourage early customer product adoption because of the belief that the product will represent a more seasoned (longer-term) solution.



Also, vendors should look to partners for complementary services capabilities in industry and cross-industry markets as missionary consultants for their products. Particularly, look to companies that are experts in the business re-engineering and business process management areas.

Acquire application development tool technology to provide product flexibility: Object-oriented application development tool capability will become increasingly important for independent software product development. It will lead to shorter product development time, much more effective product interoperability in a distributed environment and lower-cost development over time.

the 'information' and 'communication' fields. The 'information' field is defined as:

...the study of the processes of information production, distribution, access, use and evaluation, and the study of the social, cultural, economic and political contexts in which these processes take place. (p. 10)

The 'communication' field is defined as:

...the study of the processes of communication production, distribution, access, use and evaluation, and the study of the social, cultural, economic and political contexts in which these processes take place. (p. 10)

The 'information science' field is defined as:

...the study of the processes of information production, distribution, access, use and evaluation, and the study of the social, cultural, economic and political contexts in which these processes take place. (p. 10)

The 'information studies' field is defined as:

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The 'information research' field is defined as:

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Systems Software Products Market Analysis

A

User Issues and Trends

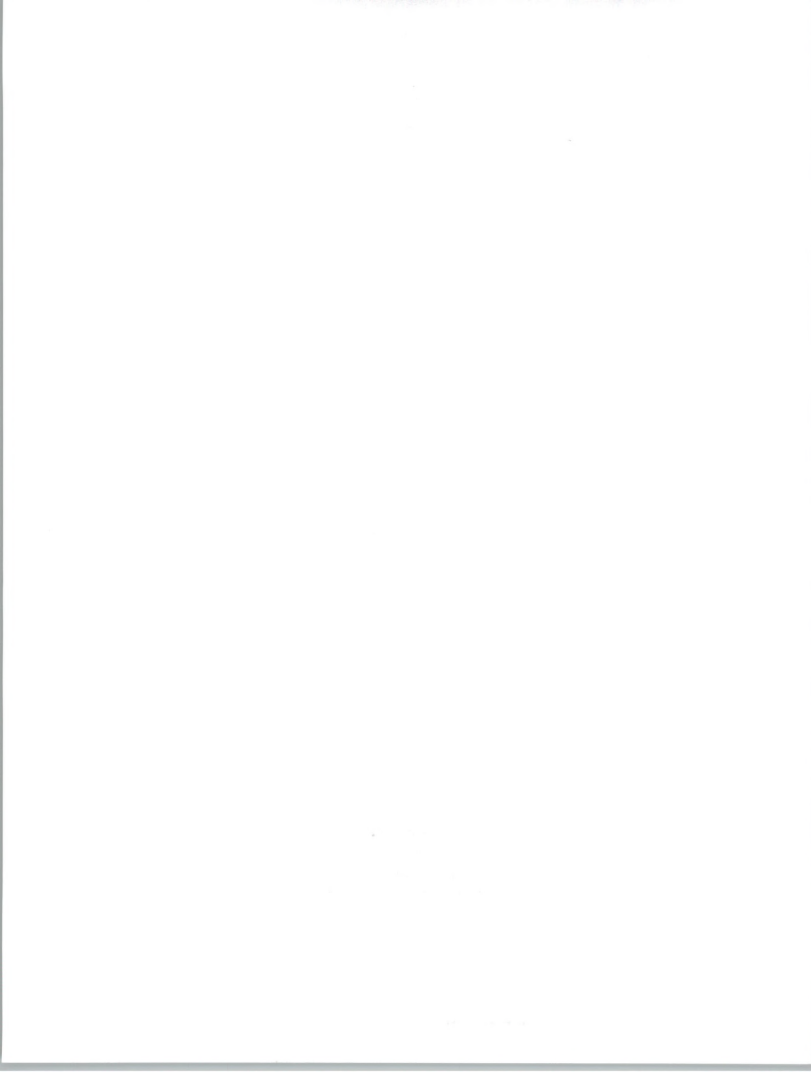
Exhibit IX-1 outlines key trends and issues affecting the information technology industry.

Exhibit IX-1

Systems Software Products—Key Trends and Issues

- Rightsizing
- Open systems
- Distributed processing complexities
- Object-oriented technology solutions for heterogeneous environments
- Windows NT, NetWare and UNIX—competition for enterprise-wide *de facto* standards
- Licensing and pricing

Rightsizing - INPUT's information systems (IS) model for the 1990s calls for movement away from centralized processing toward client/server systems and eventually toward an enterprise-wide, peer-to-peer, distributed processing environment. Eventually, any platform will be able to function as a client or server. Applications and the tools to manage them will also be distributed across the network and provide integrated, central-



ized and decentralized operations management functionality. Departmental applications and products will typically reside on minicomputers and workstations, with PCs and workstations at the desktop.

The upsizing trend to departmental-based client/server computing appears to be proceeding much more rapidly than has the downsizing movement off the mainframe. This is partially attributed to the complexities of migrating applications from a mainframe to smaller, less complex computers. In particular, systems management, data integrity and other security issues have been retardant factors.

Revenue growth from new mainframe sales, however, has slowed significantly for all manufacturers, but a small number of mainframe vendors indicate that the annual growth rate in number of mainframe MIPS shipped has expanded at the double-digit rate over the past year. This reflects the impact of a steady decline in cost-per-MIPS on mainframe class machines. Some recent benchmarks indicate mainframe pricing to be in the \$40,000-\$60,000 per MIPS range, which probably reflects a combination of competitive pricing of minicomputers and lower mainframe manufacturing costs.

Eventually the terminology for mainframes and minicomputers will probably merge, but these more complex computer architectures will continue to have a significant role for corporate-wide archival storage, central administration of distributed computing solutions and centralized applications and database servers. In a world of peer-to-peer processing the larger computers, which will most likely evolve more toward massively parallel and SMP architectures, will probably be used for many mission-critical OLTP (On-Line Transaction Processing) database applications.

Large mainframe-type computers will continue to be an important computer architecture, but will reflect lower-cost architectures and more competitive pricing. The biggest adjustment for systems software vendors will be how to retain an account for solutions traditionally sold on the mainframe, which will probably be decentralized in the future across multiple platforms.



For example, much of the operations management functionality for corporate IS has remained on the mainframe. It is important that vendors of operations/systems software management migrate their solutions to smaller platforms in order to retain their customer base, as well as to continue revenue growth and maintain or improve profitability.

In addition, many systems software and computer systems vendors possess the leading edge application development tools and database management systems (DBMS) to capture additional business from their customer bases by assisting in the development and implementation of corporate data processing migration strategies. In particular, customized application development could play a much bigger role than either in-house developed or standardized software product solutions.

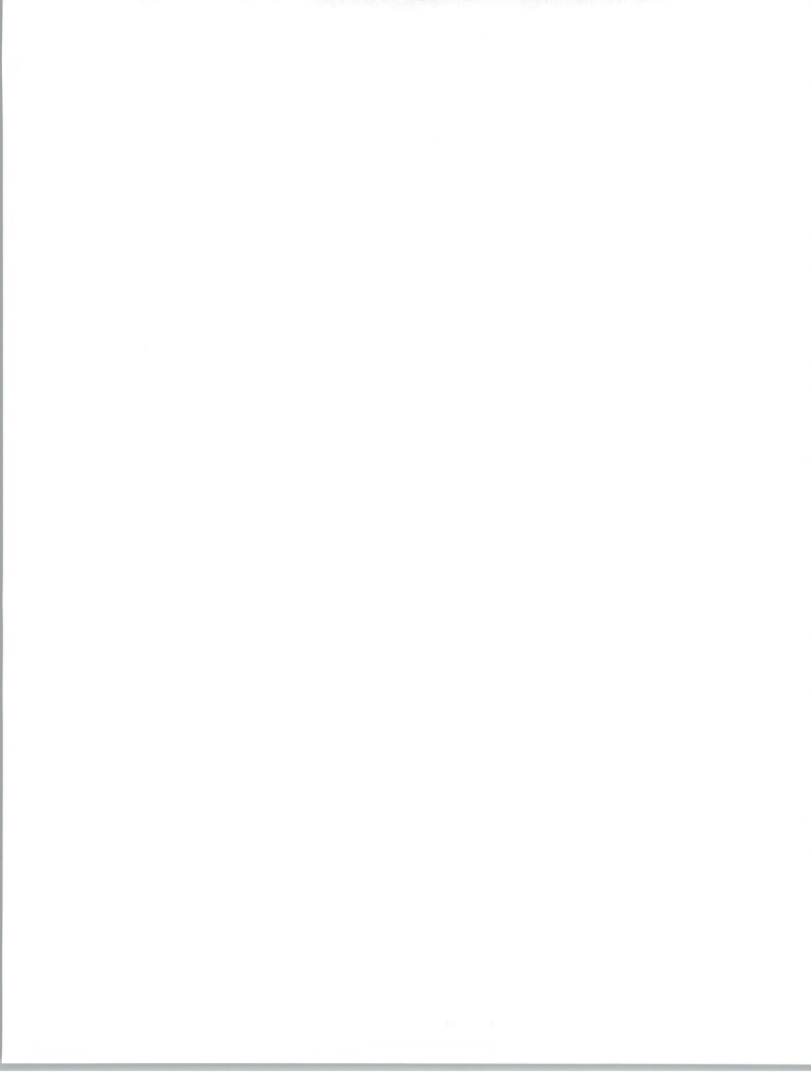
In addition, there are very few standardized client/server or enterprise-wide applications software solutions on the market. This provides a major opportunity for those vendors who can fill the void with appropriate solutions.

Open Systems - "Open systems" can be defined in a number of ways. Portability and interoperability of applications are frequently mentioned as defining elements.

It would appear that the era of open systems is finally becoming a reality. Factors that have pushed it include the Microsoft NT versus UNIX vendors competitive issue, as well as the perception on the part of users that vendor support of open systems is an important element in achieving cost reductions while rightsizing data processing functions.

Open systems consensus appears to be gaining the most momentum within the UNIX community, with the last of two major divisions (OSF and USL) coming together under the COSE initiative.

Distributed Processing Complexities - For the most part, the distributed processing elements in client/server computing today don't address the complexities of interdepartmental, enterprise-wide distributed computing. This requires much more consen-



sus on a vast complexity of *de facto* and *de jure* standards than exist today. Much of the database technology installed today is used for decision support, not for mission-critical, OLTP solutions.

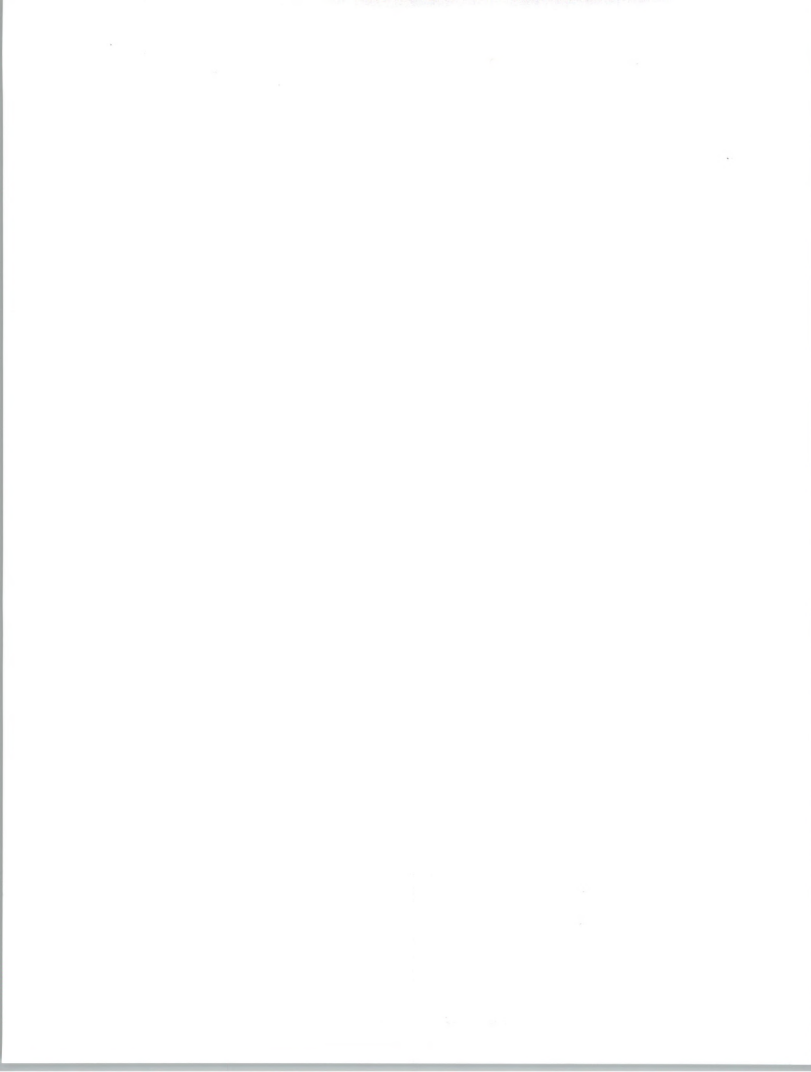
Much more consensus on a variety of distributed processing architectures and standards will be required to really drive the relational database market for production level, OLTP solutions.

Object-Oriented Technology - The ultimate solutions for distributed processing and for improving the productivity of software application development and usage are likely to come from the object programming paradigm. From an initial major entry into GUI programming, object technology is now spreading into nearly all areas of software product development. The complexity of object-oriented technology standards issues could retard the introduction process, so it is important for vendors to participate in the work of object-oriented standards groups.

Windows NT, NetWare and UNIX - The issue of the year is the battle of the operating systems vendors for market share leadership in enterprise-wide computing. The outlook of such battles reflects a number of factors, such as quality and cost of product, customer demand and the way the open systems movement develops. It will be especially difficult to displace Microsoft's major dominance at the desktop.

It is too soon after the early release of Windows NT to determine which of the contenders will be the most successful. Ultimately, the real battle may be between Microsoft's object-oriented Cairo operating system and other object-oriented solutions such as Taligent or an object-layered version of UNIX.

Licensing - There has been considerable pressure to change traditional software product licensing practices from users migrating to lower-cost platforms or to outsourcing solutions. As a result, the established tiered pricing model seems to be passing in favor of user-priced, enterprise-wide and other types of more flexible pricing models. At present, this is also creating a



great deal of user confusion in determining the best product alternatives. Licensing is a particularly important issue for systems software vendors in maintaining long-term, revenue-producing relationships with their customers.

Pricing - Software pricing, which held up for many years when hardware pricing did not, has come down, particularly at the PC level. One important impact of the Windows NT, NetWare and UNIX contest is that operating systems prices could significantly soften. One particular contributing factor could be the bundling of operating systems software with more and more hardware systems and the eventual inclusion of operating systems embedded in firmware in more computer systems. This means that systems software companies deriving an important component of their revenues from operating systems software will have to look to other types of systems software and professional services and systems integration for growth and better margins.

B

Driving Forces

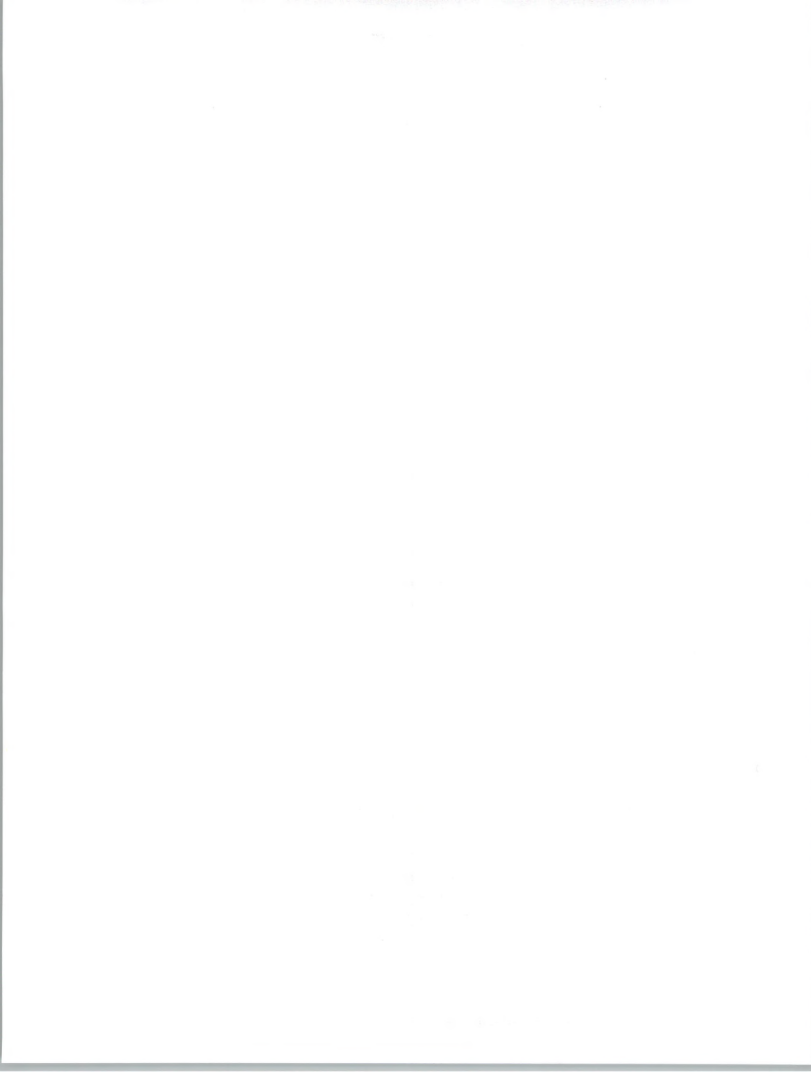
The key driving and inhibiting forces for the systems software market are listed in Exhibit IX-2.

Exhibit VI-2

Systems Software Market Driving/Inhibiting Forces

- Slow growth economy
- Open systems
- Client/server computing
- Interoperability requirements

All of these forces act as growth promoters and/or inhibitors to varying degrees and during different time frames. These fundamental forces drive INPUT's systems software products forecasts.



1. Slow Growth Economy

INPUT uses the CONSENSUS TM economic forecast published by Blue Chip Economic Indicators to provide baseline economic assumptions for U.S. information services market forecasts. This service, combined with a growing array of real data points collected by the U.S. government, forecasts a modest return to growth in 1993, followed by five years of steady growth in the GDP. The CONSENSUS report and other economic forecasters predict the real GDP to average 2.5% to 3% over the next five years. However, recent federal tax legislation, which increases taxes on U.S. corporations, could have a dampening effect on corporate capital spending in the short term. In addition, many European country economies, a major market for U.S. software products companies, are continuing to demonstrate a downward trend in economic growth. Thus, there could be at least a couple more years of flat economic growth in the major markets served by U.S. software product companies. The softer European economy has had an impact on U.S. software products companies. Novell, in particular, noted the negative pull of the European economies on its recent July fiscal quarter.

The Far Eastern economies offer a bright spot, with continuing strong economic growth being exhibited by many companies in the Pacific Rim region. This should be a major target for U.S. software products companies.

2. Open Systems

Although there are a number of definitions of open systems, portability and interoperability of data processing solutions are most commonly used.

The U.S. federal government has been pressing for open systems for several years, with requirements for compliance with a number of standards such as POSIX for internal usage and for governmental suppliers.

However, pressure for more open systems computer solutions in the U.S. commercial markets has become much more evident over the past 18 months. Examples of recent success of an "open systems" solution are the acceleration in the growth rate for

UNIX-based computer systems, which has been particularly evident at companies such as Hewlett-Packard, NCR and Unisys over the past year, and continuing strong demand for UNIX-based workstations from traditional suppliers such as Sun Microsystems. Larger commercial software companies have announced UNIX versions of their software products within the past year.

User groups, in particular, have been putting pressure on U.S. computer systems and software product vendors to provide open systems solutions. A driving force from the user, based on INPUT's recent research, is reduction in complexity of solutions as users move to lower-cost, distributed hardware platforms. The cost savings of these moves has been somewhat elusive; application development and management across a more heterogeneous mix of platforms is a principal reason that cost savings have not been more material.

The demand for open systems will have a mixed impact on U.S. computer systems and systems software vendors. Although demand will increase for products that provide a distributed processing solution, vendors' profit margins will likely decrease for many products as they become more standardized.

This means that systems software vendors will need to add products that will enhance their overall total solutions capability to get value-added pricing. In addition, systems software vendors will need to provide (either internally or through partnerships) cross-platform development tools, that will allow them to deliver cost-effective customizable solutions for additional revenue sources.

3. Interoperability Requirements

Distributed processing solutions are in an emerging phase. A number of *de facto* standards are emerging to solve enterprise-wide, internetworking-type applications.

Integration and interoperability solutions remain elusive, and administering an enterprise solution is emerging as a major problem.

Providing evolutionary and longer-term solutions for integrating and administering distributed, enterprise-wide networks will offer a major market opportunity, particularly for the larger computer systems and software products companies, with more comprehensive solutions.

Cross-platform middleware and application development tools are key product areas for addressing these interoperability issues.

The definition of middleware is somewhat elusive, but "framework" type solutions have been articulated for middleware by a number of computer systems and systems software vendors. Digital Equipment, for example, recently announced such a focus. Software framework units announced by DEC in the middleware product category include a variety of messaging software and production systems software products.

Middleware can provide the basic distributed processing framework or architecture for application interoperability. Middleware may also be described as part of the cross-platform application development tool market that provides common sets of APIs for mixing applications and data across operations systems and computer systems architectures.

Computer systems manufacturers should look to the total category of middleware and cross-platform development tools to enhance revenues, as operating systems software pricing is likely to decline significantly within the open systems environment.

C

Market Size and Forecast, 1993-1998

As indicated in Exhibit IX-3, INPUT forecasts that the systems software market will expand from \$21.7 billion in 1993 to \$31.2 billion in 1998, for a compound annual growth rate (CAGR) of approximately 8%. This reflects a dramatic lowering in growth rate expectations from INPUT's projection in 1992 of the five-year 14% CAGR for the systems software market. This revision

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reflects INPUT's growth assumptions for the domestic economy over the next few years at the low end of the 2.5% to 3.0% that was estimated in 1992; a downward revision in the growth forecast for the systems control product market, reflecting more intense pricing pressures from increased product competition and product standardization; more bundling of systems software solutions, particularly operations management and systems control; and short-term user confusion about migration approaches to distributed processing.

Exhibit IX-3

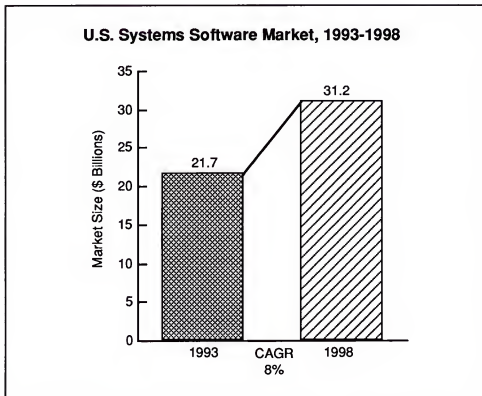
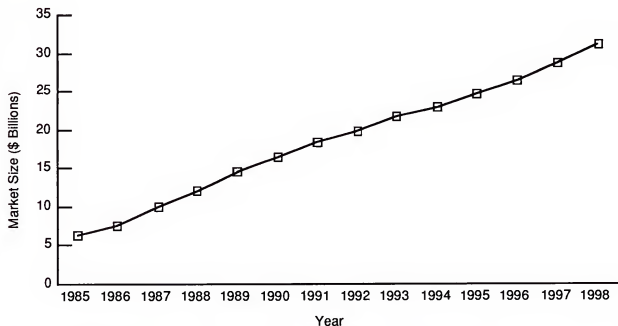


Exhibit IX-4 outlines the historical growth of the U.S. systems software market from 1985 to the present, along with INPUT's projections for specific market size in each of the years from 1993 through 1998.



Exhibit IX-4

User Expenditure on Systems Software, 1985-1998

Of the projected total information services market of \$135 billion in 1993, the systems software market is projected to represent 16%. Systems software is projected to represent 13% of the total information services market in 1998. The market for applications development tools is expected to grow at a significantly faster rate than the other two segments, systems control and operations management. This reflects the potential for value-added features and pricing of application development tool products (and services) over this time frame, particularly during a period when cross-platform application development will require much more complex tool sets. Also, the growing sophistication of application development tools could eventually have a significant positive impact on the cost of software application. Eventually the two markets for application development tools



and application products will blend. Even today, it is difficult to separate application development tool products from application development services—a potentially enormous market, in general, relative to systems software products.

INPUT is emphasizing in this report the value to systems software companies of rapidly expanding their capabilities in application development tool technologies and reorienting their product focus to services markets such as application development and implementation. The latter represent the major market opportunities for systems software companies in the second half of the 1990s.

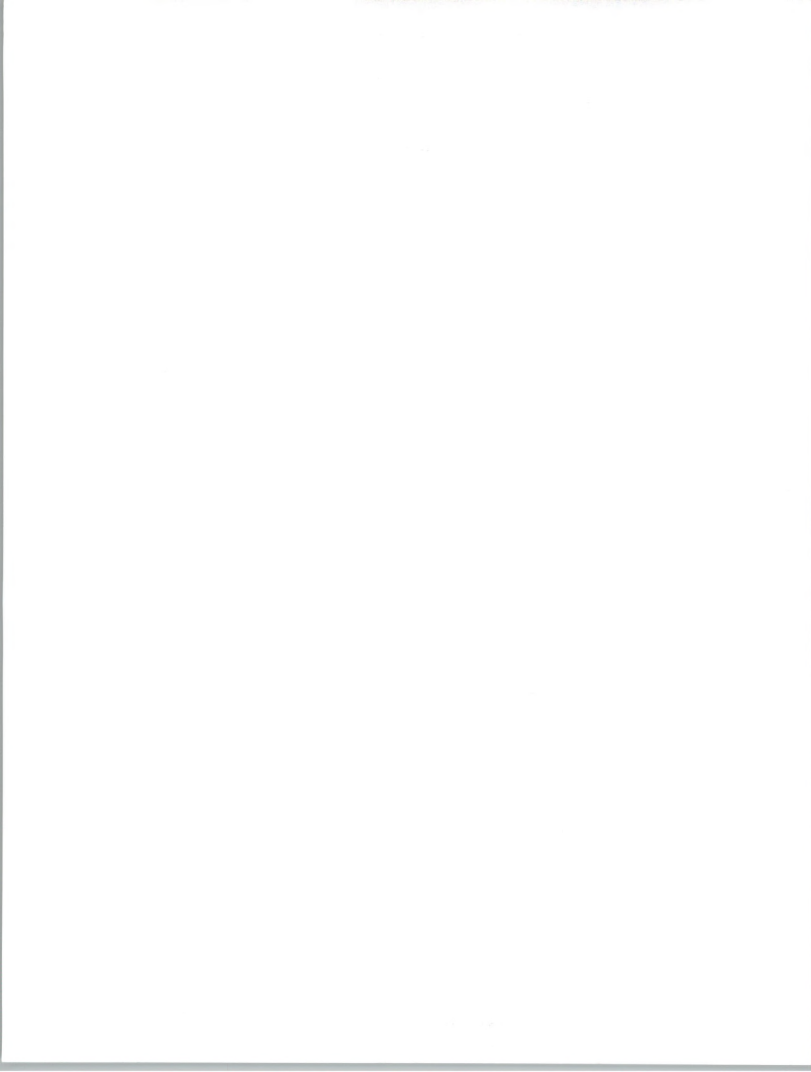
D

Vendor Competition

There has been considerable consolidation in the systems software industry in recent years. This has been particularly true in the operations/system management market, with companies such as Computer Associates, Legent and Sterling Software utilizing acquisitions to diversify product offerings and to accelerate revenue growth.

Computer Associates has been particularly successful in its acquisition program, and although Legent has experienced some temporary problems in consolidating recent acquisitions, it too has benefitted from an expansion in product choices for additional platforms.

In the systems control area, the major systems software battle of the decade is shaping up between Microsoft's Windows NT and follow-on, object-oriented Cairo operating system against Novell's NetWare/UnixWare and the UNIX group of operating systems. There will not be any clear winners, but one aspect of the competition is that it has accelerated the development of partnerships within the industry, particularly among UNIX-based computer systems vendors. This is most evident in the development of COSE, with the agenda of creating portability between the two major UNIX factions, USL and OSF.

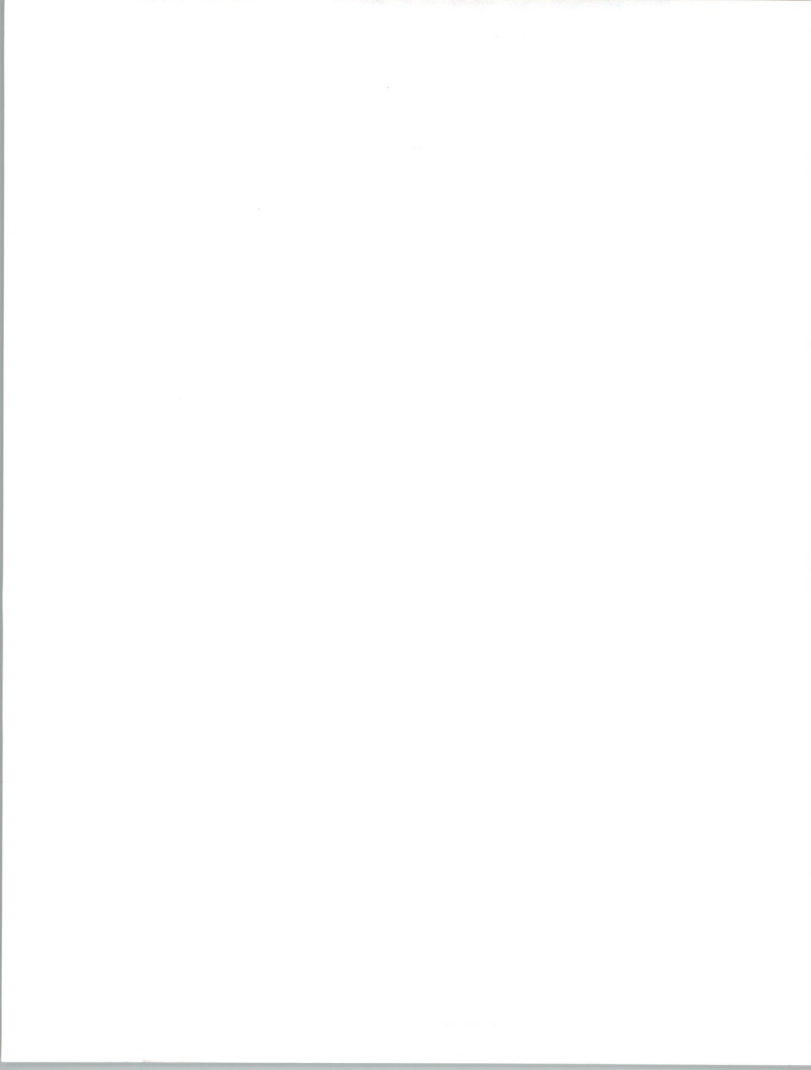


Enhanced competition can be expected to be a plus for customers, in that enhanced connectivity and portability of applications will result, thus lowering the overall cost of software products. In addition, this new competition in the operating systems software market should lead to lower prices.

Although customer demand will ultimately be the deciding factor as to which operating systems garner increased market share, the issue of "open systems" preferences voiced today by many user and vendor groups will also shape the competitive outcome. Open systems has a number of definitions, as has been indicated earlier in this report. At least from the vendor's perspective it can have a rather unique interpretation in the competitive environment mentioned above. Among the UNIX and Novell networking operating systems partnerships, openness appears to represent sharing of various systems software elements, which, when developed through common interfaces, provide for interoperability and the opportunity for the various partners to enhance revenues through providing additional elements of functionality.

With Microsoft, technology sharing with partners appears to be more of a one-way relationship. Systems software vendors can contribute code to Windows NT, but the code must be integrated by Microsoft, to maintain the homogeneity of Windows NT. Computer systems companies can benefit by reselling the Windows NT product, but there will be a question of its value if a number of computer systems companies bundle Windows NT with their total systems offering. Some computer manufacturers will save considerable R&D dollars by not developing and maintaining an operating systems software product. However, systems vendors will have to get more value added from consulting, application development, and implementation services to help offset declines in potential revenue sources in operating systems software.

There is likely to be a significant shakeout in the application development tools and database management systems vendor industry over the next few years. In particular, many younger companies that initially pioneered the tool markets, with em-



phases on Windows-based programming interfaces, are going to face considerable competition from 4GL and integrated CASE companies which incorporate object-oriented technology into enterprise-wide development tools.

The systems software companies, in general, should outperform the applications industry by utilizing their application development tools to provide total solutions to their clients, as Oracle has done in its Oracle Industries model. In addition, the computer systems companies are in a good position to garner more applications development business if they use their combined systems software strengths to migrate their customer bases to the new generation of distributed processing. They should also look to establishing partnerships with the leading independent application software products companies to provide them a larger sales and service organization, which leverages the resources of both partners.

Strategic partnering will continue to be a major factor in the systems software products industry, with some new twists: more partnering on standard interfaces and more partnership between systems software and applications software products companies.

Exhibit IX-5

**Leading U.S. Systems Software
Products Vendors**

Vendor	1992 Market Share (Percent)	1992 U.S. Revenues (\$ Millions)
IBM	17	3,485
Digital Equipment Corp.	3	610
Microsoft	3	574
Computer Associates	3	543
Novell	2	453
Hewlett-Packard	2	320
Oracle	1	250
Unisys	1	215

E**Conclusions and Recommendations**

Summaries of INPUT's conclusions and recommendations for systems software vendors in the second half of the 1990s are included below, in Exhibits IX-6 and IX-7.

Exhibit IX-6

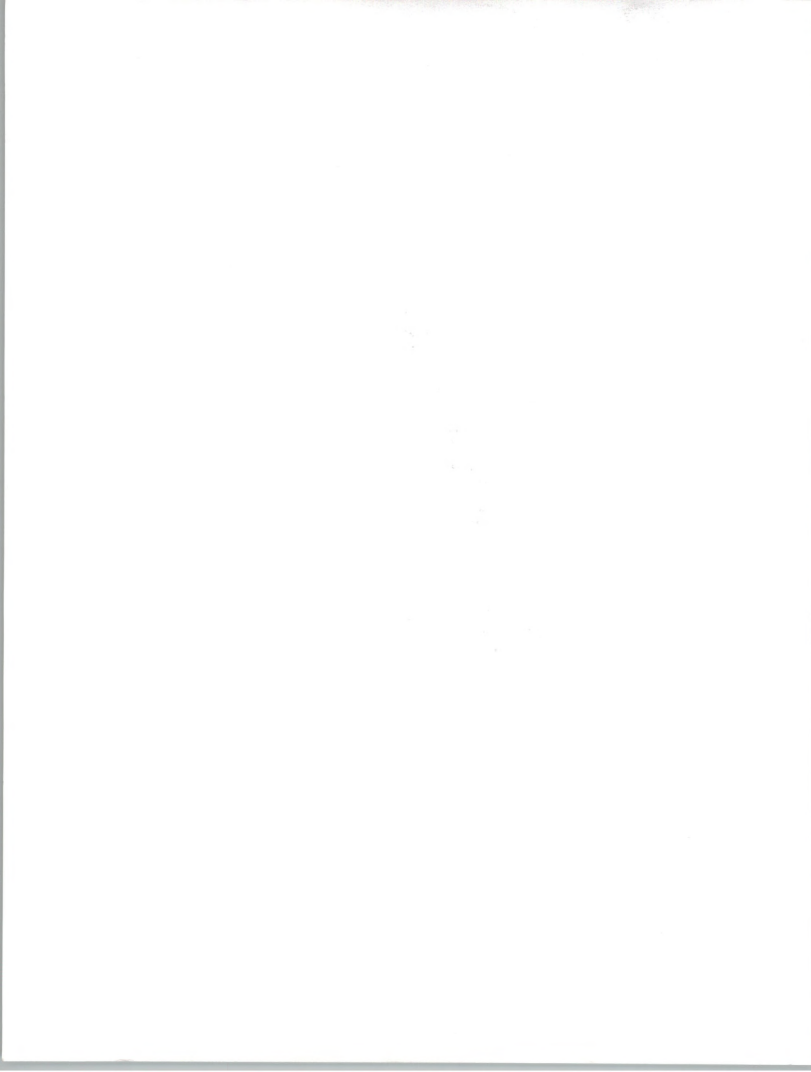
Conclusions

- Application development and other types of professional services will provide a major market for systems software vendors in the era of rightsizing
- Open systems will provide more cost effective solutions, but potentially lower-margin solutions
- Open-systems products should be enhanced with value-added consulting and other professional services
- Object-oriented technology will be an increasingly important application development tool in a distributed computer environment
- Systems management tools for an open-systems environment will provide a major product opportunity

Exhibit IX-7

Recommendations

- Support industry standards and get them implemented
- Form strategic alliances with care
- Develop expertise in object-oriented technology
- Capitalize on migration difficulties of corporate IS by providing total solutions capabilities
- Pursue client/server and open system architectures. Avoid being "locked in" on a single platform/architecture





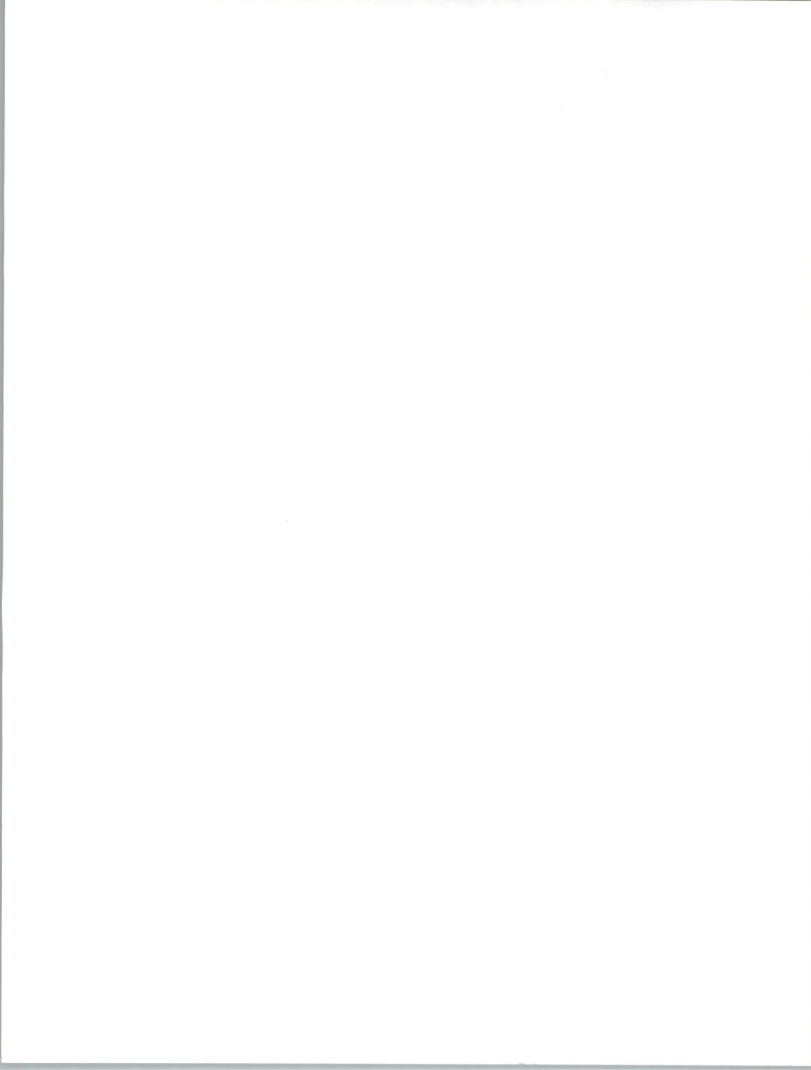
List of Companies

A.D. Little
ACS
Advantis
American Airlines
Ameritech
Anacomp
Analyst International
Andersen Consulting
ASK Computer
AT&T Corporation
Autodesk
Automatic Data Processing, Inc.
Bank of America
Basis Information Technologies
BDM International
Boeing Computer Services
Borland International
BP Exploration
CableData
Cadence Design
Camabridge Technology
Ceridian
CGA
Chubb Insurance
Citicorp
Cobre Group
Computer Associates International
Computer Horizons
Computer Sciences Corporation
Comtex
Continuum



CTG
DataArchitect
Deloitte & Touche
Digital Equipment Corporation
Dow Jones (Telerate)
Dun & Bradstreet Corporation
Electronic Arts
Electronic Data Systems
Equifax
Ernst & Young
Excel Partners
Filenet
First Data Resources
First Family Financial Services
First Financial Management
FIserv
General Dynamics
General Motors
Georgia Federal Bank
Grumman
GTE (Centel)
Gupta Corporation
Hewlett-Packard
Hughes
IMI
Interactive Network, Inc.
Intergraph
International Business Machines
ISSC
Keane
KPMG
Legent
Lockheed
Logicon
Lotus
Martin Marietta
MasterCard
McGraw-Hill
MCI
McKinsey & Co.
Mead Data Central
Mentor Graphics

Metropolitan Life
Microsoft
NASDAQ
NETG
Novell
NYNEX/AGS
Octel
Oracle
Planning Research Corp.
Policy Management Systems
Popkin Software & Systems
Powersoft Corporation
PRC
Price Waterhouse
Prodigy
Proginet Corp.
QVC
Republic Bank
Reynolds & Reynolds
SAIC
SAP America
SAS Institute
Shared Medical
SHL Systemhouse
Sterling Software
Sun Microsystems
Systematics
Taligent
TransUnion
Trecom
TRW
Unisys
Visa
WordPerfect



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